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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.

Manuscript

Ball, Carleton R. - New or little known West American willows.
Univ. Calif. Publ. Bot. 17(14): 399-434, pl. 67-74. Sept. 1934

Page 1 lacking. ~~Some pages were reassembled (ribbon & carbons) from various folders and numbered. The ribbon copies, edited in red pencil, for part of the text were not found.~~

W. A. Archer June 1964

NEW or LITTLE-KNOWN WESTERN WILLOWS.

By CARLETON R. BALL

The paper contains full descriptions, discussions, and herbarium-specimen citations of (3) new species and (4) new varieties of *Salix*, by Ball, and of one little-known species, *S. Farrae* Ball, briefly described previously. The 7 novelties are *S. Parksiana* (Longifoliae), *S. Tracyi* (Cordatae), *S. Setchelliana* (Herbaceae), *S. brachycarpa* var. *Mexiae* and var. *Sansoni* (Glaucæ), *S. glauca* var. *Aliceae* (Glaucæ), and *S. ~~Scouleriana Thompsoni~~^{var.}* (Capreae). The first two are from California, the next 4 from Alaska, and the last from Washington.

S. Farrae microserulata Ball (Cordatae),
^ *S. Tracyi* (Cordatae), *S. Setchelliana* (Herbaceae), *S. brachycarpa* var.
Mexiae and var. *Sansoni* (Glaucæ), *S. glauca* var. *Aliceae* (Glaucæ),
and *S. ~~Scouleriana Thompsoni~~^{var.}* (Capreae).

etc
SALIX PARKSIANA n. sp. nov.

8pt
Plates 1 and 2.

67 68
Description.

10pt Salix
Section

Section Longifoliae. Frutex, 1.5-3 m. altus; ramulis obscure brunneis, plerumque pilosis; foliis anguste ellipticis, subsessilibus, apice basique acutis, irregulariter et frequenter remote denticulatis, pilosis; amentis coetaneis, 4-8 cm. longis, solitariis aut 2-4 aggregatis, pedunculos longos foliosos aut surculos anni terminantibus; squamis florum ovatis obovatisve, stramineis, glabratibus; staminibus 2, filamentis liberis, in dimidio basali dense undulato-pilosis; capsulis ovate-lanceolatis, 5 mm. longis, sessilibus subsessilibusve, glabris; stylo obsoleto, stigmatibus ^{brevibus,} ~~curtis~~ divisis. Frondes multo ut in S. sessilifolia sed capsules multo ut in S. melanopsidis.

Section Longifoliae. A shrub, 1.5-3 m. high; branchlets dark brown, mostly pilose; leaves narrowly elliptical, subsessile, acute at both ends, irregularly and often remotely denticulate, pilose; aments coetaneous, 4-8 cm. long, solitary or 2-4 together, terminating elongated leafy peduncles or seasonal shoots; flower scales ovate or obovate, straw-colored, glabrate; stamens 2, filaments free, densely crinkly-pilose on the basal half; capsule ovate-lanceolate, 5 mm. long, sessile or subsessile, glabrous; style obsolete, stigmas short, divided. Foliage much as in S. sessilifolia but capsules much as in S. melanopsis.

GALLI PARKSIANA Ball, n. sp.

Shrub, 4-8 feet (1-2.5 m.) high, with dark brown, pilose branchlets; elliptical, sessile, irregularly denticulate, pilose leaves, acute at both ends; long-pedunculate, solitary or clustered, coetaneous aments; glabrate ovate or obovate, ^{yellow} scales; sessile or (2 stamens with free filaments densely crinkly-pilose on the basal half); subsessile glabrous capsules about 5 mm. long; obsolete styles, and short divided stigmas. Foliage much as in S. sessilifolia but capsules much as in S. melanopsis.

Low to midheight caespitose shrub, 3-8 ft. (1-2.5 m.) high, usually 4-6 feet; bark gray, branchlets brown to dark brown, ~~the~~ seasonal and 1-year shoots densely, and ~~the~~ 2-year shoots thinly to densely, pilose or pilose-tomentose with white hairs; lenticels small, 0.2-0.4 mm. wide, broadly oval to orbicular, hemispherical, projecting; bud scales 5-6 mm. long, obtusish, dark brown, thinly to densely pilose-tomentose.

Leaves exstipulate and sessile, except on vigorous shoots; stipules wanting on fruiting branchlets, lanceolate ~~in~~ or semicordate to ovate, 2-4 or 5 mm. long, acute, denticulate, and pilose on vigorous shoots; petioles practically wanting on leaves of fruiting branchlets but 1-2 mm. long on shoots and occasionally 4-6 mm. long on very vigorous growth, pilose; blades ^{usually} narrowly to ^{usually} broadly elliptical, or occasionally elliptical-oblongate to oblong-elliptical, acute at both ends, abruptly tapering at base, often apiculate at apex or shoot, ^{new arm,} leaves short-acute, 4-12 cm. long, 0.8-2.6 cm. wide, common sizes being ⁵ 4 x 0.8-1.1, 5 x 1.2-1.5, 6 x 1.5-1.8, or 2.2, and 7-8 x 1.6-2 or 2.5 ~~cm.~~ on fruiting branchlets, and 7 x 2.5, 8-9 x 2.7, 9-10 x 2.2-2.7, and 11-12 x 2-2.6 ~~cm.~~ on vigorous shoots, irregularly and sometimes remotely glandular-denticulate on ~~the~~ margins, the teeth sometimes spinulose and curved toward the leaf apex, both surfaces, including ~~the~~ midrib and veins, densely to thinly pilose or pilose-tomentose with silvery hairs, sometimes concealing the teeth, ~~or~~ the small inferior leaves ^{sometimes} glabrate.

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Aments coetaneous, borne on ~~12~~ elongated leafy seasonal shoots, solitary or in clusters of two to four, ~~the~~ distal ament earlier than ~~the~~ lateral in flowering; ~~the~~ peduncles or seasonal shoots flowering 2-4 or 5 cm. long in flower, becoming 4-7 or 10 cm. long in fruit, and bearing 3-5 foliage leaves, of which one often ^esubtends a secondary leafy shoot.

Staminate aments cylindrical, slender, 4-7 or 8 cm. long, 7-9 mm. wide, somewhat lax at base, yellow; flower scales elliptical-oblong to obovate, subacute to usually rounded or somewhat truncate, pale yellow, thinly pilose with crinkly hairs, becoming glabrate, especially on ~~the~~ dorsal surface and toward ~~the~~ apex; stamens 2, filaments free, 3-3.5 mm. long, densely pilose with crinkly white hairs on ~~the~~ basal half or two-thirds.

Pistillate ~~aments~~ slender, often elongated, 4-6 or 8 cm. long in flower, becoming 4-9 ~~or~~ (sometimes up to 11-13) cm. long in fruit, 1-1.4 cm. wide; flower scales oblong-ovate to ovate, acute to obtuse, 2-3 mm. long, 3-veined, thinly pilose ~~pubescent~~ tomentose when young, becoming glabrate on ~~the~~ outside, especially toward ~~the~~ apex; capsule narrowly ovate to ovate, from a subacute base, sessile to subsessile, 4.5-5 or 5.5 mm. long, brown, glabrous or ~~the~~ ovary sometimes thinly pilose; pedicels 0.2-0.4 mm., or ~~the~~ lowermost occasionally 1 mm. long; style obsolete; stigmas short, 0.2-0.4 mm. long, divided, spreading; seeds linear-ob-lanceolate, about 0.8 mm. long, coma hairs 3-4 mm. long; gland 1, ventral, subcylindrical, slender, capitate, about 1 mm. long.

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leaded
? Salix Parksiana belongs to Section Longifoliae, the long-leaf or sand-bar willows, so abundantly distributed over the western and part of the eastern United States, and from Mexico to Alaska and the Yukon Territory. The section is composed of two groups. One group, ^{*limited*} ~~confined~~ to the Pacific Coast, has pilose capsules, mostly evident styles, and long stigmas, and contains S. fluvialis Nutt., S. sessilifolia Nutt., S. Hindsiana Benth and its varieties, and S. taxifolia Kunth., the latter having almost no style. The second group, occupying nearly the entire continent, is distinguished by ^{*usually*} mostly glabrous capsules (though the ovaries sometimes are pilose), obsolete styles, ^{*usually*} and mostly short sessile stigmas. S. Parksiana belongs to this group, which contains S. interior Rowlee (S. longifolia Muhl.), S. exigua Nutt. and its many varieties, S. melanopsis Nutt. and its several varieties, and S. argophylla Nutt. The last three are confined to the western United States.

here
Salix Parksiana is most closely related to S. melanopsis Nuttall, and especially to its variety, Bolanderiana (Rowlee) Schneider, with leaves more or less pubescent-tomentose. In aments and capsules it differs scarcely at all from melanopsis. The large and markedly elliptical leaves, with their ^{*usually*} silvery pilose covering, however, are very similar to those of S. sessilifolia Nuttall. The limited known range of S. Parksiana is within the range of S. melanopsis and its varieties, and lies just at the southern end of the known range of S. sessilifolia. There is absolutely no evidence of hybridity, however, in the more than 20 sets of S. Parksiana collected in 1931.

It is a great pleasure to name this species in honor of my friends, Mr. Harold E. Parks and Mrs. Susan T. Parks, ~~of Berkeley and Trinidad~~, whose ^{*interest in*} devotion to the California flora ^{*has aided*} is a joy to many specialists. They are primarily responsible for the discovery of this willow and for the collection of that abundance of material which permits an adequate description and freedom from misgivings ^{*in respect*} as to the validity of the species.

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7 Types. -

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The staminate type collection is Parks No. 0983, collected on May 21, 1931, from gravel bars of Smith River near the Roosevelt Highway Bridge, Del Norte Co. The pistillate type is Parks 0962, collected on May 14, 1931, in river gravels of the Van Duzen River between Alton and Carlotta, Humboldt Co. The type specimens are in the herbarium of the University of California, (sheets Nos. 481288-289 (S), and 481366-367 (S)), and exactly similar cotypes are in the herbarium of the writer. Specimens of Both numbers were widely distributed to the leading herbariums of the world, under printed labels showing them to be the type collections. miter's

Distribution. -

Salix Parksiana is known only from a strip of coastal plain about 100 miles long, in Humboldt and Del Norte Counties, in extreme northwestern California. All the rivers of this area have their headwaters in the various minor ranges of the Coast Range, and in their lower reaches flow in a northwesterly direction into the Pacific Ocean. From south to north, the rivers reaching the ocean are the Eel, Mad, Klamath, and Smith, of which the Eel and Klamath are large streams with many tributaries. This willow has been collected on three of these systems. Van Duzen River is a small stream rising in the Coast Range and flowing west to join the Eel River near the ocean. Trinity River rises in the Coast Range and flows nearly due north into the Klamath, Willow Creek entering the Trinity from the west, not far above its mouth in northern Humboldt Co. Smith River is a short stream rising in the Siskiyou Mts., crossing the extreme northwestern corner of Del Norte County, and reaching the ocean near the Oregon boundary.

7 Habitat. -

Salix Parksiana, like the closely related S. melanopsis Nuttall, is a plant of gravel bars, or rocky or sandy beds or banks of streams. Apparently it does not occur in alluvial meadows.

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The specimens listed below have been examined. ~~The herbariums represented by the initials in parentheses are: CRB, Carleton R. Ball; UC, University of California.~~ The arrangement is from south to north.

California Humboldt Co.

✓ Bel River at mouth of Larrabee Creek, alt. 200 ft., Joseph P. Tracy 10291^(?), July 31, 1932 (CRB, UC) ~~✓~~

Van Duzen River, Bridgeville, Alt. 750 ft., ~~Joseph P.~~ Tracy 10129^(?), June 4, 1932 (UC). Van Duzen River between Alton and Carlotta, alt. 15 m., shrubs 1-2 m. high, in river gravel, Harold E. Parks 0961 ^(?), 0962 (pistillate type), 0964 ^(?), all May 14, 1931 (CRB, UC). Van Duzen River, alt. 100 ~~to 300 ft.~~, Alton, Joseph P. Tracy 9682, Sept. 19, 1931 (CRB, UC). ~~✓~~

Trinity River, Shrub 2 m. high, on sandbars, mouth of Willow Creek at Trinity River, alt. 150 m., ~~H. E. Parks and J. P. Tracy~~ 0967, May 17, 1931 (CRB, UC).

Del Norte Co.

✓ Smith River at or near Roosevelt Highway Bridge, about 5 miles above the mouth, and alt. about 50 ft.: Shrubs 1-2.5 m. high, on gravel bars, Harold E. Parks 0977 ^(?), 0978 ^(?), 0979 ^(?), 0980 ^(?), 0982 ^(?), 0983 (staminate type), 0987 ^(?), 0990 ^(?), and 0992 ^(?) (CRB, UC); Shrubs 1-2.5 m. high, frequent in gravelly river margin, ~~H. E. Parks and J. P. Tracy~~ 01003 ^(?), 01004 ^(?), 01006 ^(?), 01007 ^(?), 01010 ^(?), 01013 ^(?), 01014 ^(?), and 01015 ^(?), all May 30, 1931 (CRB, UC); ^{my} Gravel bars 5 miles above the mouth, alt. 50 ft., ~~Joseph P.~~ Tracy 9472 ^(?), 9476 ^(?), 9478 ^(?), 9483 ^(?), and 9486 ^(?), all May 30, 1931 (CRB ~~except~~ 9478 ^{and} 9486; UC); 10811 ^(?), 10816 ^(?), Sept. 24, 1932 (CRB, 10811 only; UC); Shrub 1-1.5 m. high, on gravel bars in water, ~~Harold E. Parks~~ 01054 ^(?) ~~(col. 4 sheets)~~, July 10, 1931 (CRB, UC). ~~✓~~

Smith River at Gasquets, alt. 300 ft., Scarce here, near its eastern limit, Joseph P. Tracy 10855, Sept. 24, 1932 (CRB, UC).

Spt *cle* *g*
 SALIX TRACYI Ball, n. sp.

Plates *8* and *4-170*

Section Cordatae. Shrub to small tree 2-6 m. high; branchlets slender, finely puberulent to glabrous; leaves oblanceolate to narrowly obovate, entire, thin, glaucous ~~in~~ and thinly pubescent to puberulent to glabrous beneath; aments slender, midsize, subprecocious, short-peduncled, 2-4 cm. long; scales obovate, dark, thinly pilose; capsules 4.5-5.5 mm. long, glabrous; pedicels 1-2.5 mm. long; styles 0.2-0.4 mm. long, entire; stigmas about equalling ~~the~~ style.

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 Sectio Cordatae. Frutex usque ad arbor parva 2-6 m. altus; ramulis gracilibus, minute puberulentis usque ad glabris; foliis oblanceolatis usque and anguste obovatis, integris, tenuibus, inferne glaucis et sparse pubescentibus aut puberulentis usque ad glabris; amentis gracilibus, subpraecoquis, breviter pedunculatis, 2-4 cm. longis; squamis obovatis, obscuris, sparse pilosis; capsulis 4.5-5.5 mm. longis, glabris; pedicellis 1-2.5 mm. longis; stylis 0.2-0.4 mm. longis, integris.

A slender, graceful, sparingly cespitose, shrub or small tree, 2 to at least 6 ~~meters~~ high; trunks grayish-green, smooth; branchlets slender, ~~the~~ 3-year and 2-year grayish-yellow to brownish, glabrate except behind the buds, ~~the~~ 1-year and seasonal shoots yellowish to brown, ~~the~~ 1-year glabrous in spring through sloughing of the puberulent epidermis, the seasonal finely puberulent or occasionally subpubescent. Bud scales stout, short, ovate or broadly lanceolate, 3-6 mm. long, mostly obtuse, colored and clothed as ~~the~~ branchlets on which borne, ~~the~~ color of all branchlets varying much with age and exposure.

Leaves midsize, petioled, those on vigorous shoots stipulate; stipules (on vigorous shoots only) 3-9 mm. long, 1.5-4.5 mm. wide, ~~the~~ smaller nearly ovate, ~~the~~ large nearly semi-cordate, entire to sparingly rounded-dentate, colored as ~~the~~ blades; petioles slender, 2-5 or 7 mm. long on ~~the~~ fruiting branchlets, up to 1 cm. long on ~~the~~ vigorous shoots, colored and clothed as ~~the~~ branchlets; blades oblanceolate, elliptical-oblanceolate, or narrowly

obovate, 3-5 cm. long and 1.5-1.8 mm. wide on fruiting branchlets, up to 13 cm. long and 2.5-3 cm. wide on vigorous shoots, common sizes ^{in cm.} ~~being~~ 4 x 1.2-1.6, 5 x 1.6-1.9, 6 x 1.3-1.5, and 7-8 x 2, or, on vigorous shoots, 10-11 x 2-2.5 and 12-13 x 2.5-3 ~~cm.~~, mostly subcuneate or acute at base, those on fruiting branchlets broadly acute to obtuse or rounded and sometimes apiculate, ~~and~~ entire, those on vegetative shoots larger and proportionately narrower, acute to subacuminate, often shallowly crenate-serrulate, not or scarcely glandular, the young often puberulent or pubescent, becoming thinly so by expansion, and usually glabrate to glabrous as they become older, clear green above, glaucous beneath, ~~the~~ midvein yellow, ~~the~~ slender secondaries diverging at angles from 20° to 45° and curving upward near the margin, ~~the~~ ~~tertiaries~~ subimpressed to plane in young leaves, becoming elevated with maturity, ~~the~~ tertiaries forming small irregular polygons.

Aments slender, midsize, subprecocious to somewhat coetaneous, on shoots of the previous season; peduncles short, ^{pubescent,} ^{staminate} bracted or leafy, ~~the~~ ~~pistillate~~ 2-4 mm. long and bearing 2-4 very small leaf-like bracts, ~~the~~ pistillate 5-10 or occasionally 14 mm. long and bearing 2-4 small leaves. Flower scales spatulate-obovate or broadly oblanceolate to sometimes cuneate, ^{1-1.3 mm. long,} oblong, entire, obtuse, or truncate at apex, or ~~the~~ lowermost sometimes acute, thinly to rather densely clothed, especially ³ beneath, with short grayish wanting hairs. Gland ventral, minute or ^{dark brown to blackish,}

Staminate aments 2-4 cm. long, about 1 cm. wide, yellow; stamens 2, ^{one-third} ~~the~~ filaments about 4 mm. long, united at base for about 1/3 of their length, glabrous; anthers subglobose, about 0.5 mm. in diameter.

Pistillate aments 2-5 or rarely 6 cm. long, ^{1.2-1.5 cm.} ~~1.2-1.5~~ wide, rather compact; capsules lanceolate, acute, 4.5-5.5 or 6 mm. long, usually acutish at base, long-pedicelled, glabrous (ovary also), yellowish brown; pedicel slender, 1-2.5 or rarely 3 mm. long, ~~the~~ lower always the longer, yellowish-brown, glabrous; styles short, 0.2-0.4 or 0.5 mm. long, entire; stigmas about equalling ~~the~~ style, entire or notched; seeds oblong oblanceolate, obtuse, 1-1.2 mm. long, dark brown, ~~the~~ coma hairs about 3 mm. long, straight, white.

Flowering occurs from late April throughout May in normal seasons and fruiting follows in ~~the~~ due course of about two weeks.

It is a great pleasure to dedicate this species to Joseph P. Tracy^c, of Eureka, Humboldt County. With his sister, Miss Ethel Tracy, this veteran collector of our northern redwood paradise has done more than any other botanist to make known the flora peculiar to that area. For years he has distinguished this newly-described species as the "little willow" and, as the specimens cited will show, ^{he} has collected it at many points in the two California Counties.

Salix Tracyi is related most closely to S. lasiolepis Benthams, the abundant, widely distributed, and variable arroyo willow of California and the adjacent States. The new species differs from lasiolepis in its more slender branchlets; ⁱⁿ its thinner, broader, less pubescent, more obovate, and less veiny leaves; in its smaller and much less pilose flower scales; in its smaller capsules, longer pedicels, and shorter styles; and in later flowering. The leaves of S. lasiolepis vary from linear or linear-oblong in New Mexico, Arizona, and southern California, to narrowly oblanceolate in most of the Coast Range area. Even the more or less obovate leaves of variety Bigelovii (Torrey) Bebb are thick, firm, and veiny as compared with those of Tracyi. In lasiolepis the capsules average about 5 mm. long, the pedicels seldom exceed 1 mm. in length, and the styles normally are 0.7-1 mm. long. In the same habitats and localities, S. lasiolepis normally flowers and fruits some 2 to 4 weeks earlier than S. Tracyi.

Habitat. — Tracy's willow is an interesting component of that group of more or less localized endemic willows of northern California and southern Oregon, ^{which} including S. delnortensis Schneider, S. Parksiana Ball, S. melanopsis gracilipes Ball, and others not yet described. It occurs with S. melanopsis, S. Parksiana, and S. Coulteri.

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4 Distribution. -

Salix Tracyi occurs abundantly on the numerous boulder-strewn sand and gravel bars of the rivers of northwestern California and adjacent Oregon. It has been found on the Eel, Van Duzen, Mad, Trinity, Klamath, and Smith Rivers, and some of their tributary creeks in California, and ^{on} from the three forks of the Illinois River and their tributary creeks in Josephine County, Oregon. It probably occurs over a much wider range in both northern California and southern Oregon but it has not yet been possible to study the material critically.

The specimens listed below have been examined. Most of them are recent collections and were distributed as S. lasiolepis Benthams or its variety Bigelovii (Torrey) Bebb. Some of these collections have been widely distributed in this country and abroad. ~~The initials of the herbariums from which the specimens have been seen are: CRB, C. L. R. Ball, and UG, University of California.~~ All of those collected by Mr. Tracy, and many of the others, are in his herbarium at Eureka. The following arrangement is from south to north.

4
Humboldt County, California. ↗

typel

The type collections of S. Tracyi are both from the Smith River in Del Norte County, California. The pistillate type collection is Parks and Tracy No. 0934, collected at "French Flat", just below Gasquet, on May 10, 1931. Specimens were distributed to 50 major herbariums. Tracy No. 9362 is from the same plant. The type specimen is in the Herbarium of the University of California, Sheets No. 481400 and 481401. The staminate type collection is Ball, Parks, and Tracy 01288, from Madrone Park, above Gasquet, elevation about 500 feet, on May 15, 1932. The type specimens are in the Herbarium of the University of California, sheets No. 504032 and 504035. ^{La} Distribution.

Salix Tracyi occurs abundantly on the numerous boulder-strewn sand and gravel bars of the rivers of northwestern California and adjacent Oregon. It has been found on the Eel, Van Duzen, Mad, Trinity, Klamath, and Smith Rivers, and some of their tributary creeks in California, and from the three forks of the Illinois River and their tributary creeks in Josephine County, Oregon. It probably occurs over a much wider range in both northern California and southern Oregon but it has not yet been possible to study the material critically.

The specimens listed below have been examined. Most of them are recent collections and were distributed as S. lasiolepis Benth. or its variety Bigelovii (Torrey) Ebb. Some of these collections have been widely distributed in this country and abroad. The initials of the herbariums from which the specimens have been seen are: CRB, Cagleton R. Ball, and UC, University of California. All of those collected by Mrs. Tracy, and many of the others are in his herbarium at Eureka. The following arrangement is from south to north.

Humboldt County, California.

South Fork of Eel River between Miranda and Redway, alt. 300 ft.,
bush 6-8 ft. tall, along river, Joseph P. Tracy 9803⁽²⁾, April 24, 1932 (CRB, UC).

South Fork of Eel River, Sylwandle, between Miranda and Meyers, Mrs. H. P.
Bracelin 268 (fol., 2 sheets), 269 (fol., 3 sheets), May 1, 1931 (CRB, UC).

Van Duzen River, Bridgeville, alt. 750 ft., shrub 10 ft. tall, on
river bar, Joseph P. Tracy 10128^(fol.), June 4, 1932 (CRB, UC). Van Duzen River,
Blue Slide, alt. 15-20 m., shrub 10-12 ft. high, on gravelly floodplain, Ball,
Parks, and Tracy 01244 (♀), May 12, 1932 (CRB, UC, 3 sheets each).

Mad River, Blue Lake, alt. 15 m., small rounded tree, rare, Harold
E. Parks 0997 (♀), May 20, 1931 (CRB, UC).

Mad River, gravelly floodplain at Englehart gravel pit, above Blue
Lake road, 2 miles east of Redwood Highway, an individual plant about 6 ft.
high, forming a clump 25 ft. in diameter, Ball, Parks, and Tracy 01254 (♀),
May 13, 1932 (CRB, UC, 3 sheets each). Same place, plant 3-5 ft. high, forming
a clump 15 ft. in diameter, Ball, Parks, and Tracy 01255 (fol.), May 13, 1932
(CRB, UC, 2 sheets each).

Trinity Highway
Redwood Creek at Berry's (road from Mad River to Trinity River),
Joseph P. Tracy 6189 (♂) and 6189A (♀), April 15, 1923 (UC);— 7154 (fol.),
scraggly bush 6-10 ft. tall, June 28, 1925 (UC);— 7451 (♀), bush 6-8 ft. tall,
May 1, 1926 (UC);— 7885 (♀, same bush as 7995); 7886 (♀, same plant as 7996),
6-10 ft. tall; 7887 (♀) and 7888 (♂), all April 10, 1927 (CRB 7885 and 7887;
UC all);— 7995 (♀, same bush as 7885) and 7996 (♀, same bush as 7886), May 13,
1927 (CRB 7995 only; UC);— 8305 (fol.), Aug. 7, 1927 (CRB, UC) ^{Redwood Creek at Berry's} slender
shrubs 6-10 ft. high, on gravelly margin of creek, Ball, Parks, and Tracy
01319 (♀), 01320 (♀), and 01321 (♂), May 17, 1932 (CRB, UC, 2 sheets each).

Willow Creek at Graham's, about 1 mile above Trinity River, low
shrub 6-8 ft. high, edge of artificial pond, Ball, Parks, and Tracy, 01338
(♀), May 17, 1932 (CRB, UC).

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Trinity River at mouth of Willow Creek, ~~at~~¹ 150 m., only a single individual, 5 m. high, ~~M. B.~~ Parks and ~~J. P.~~ Tracy 0976 (♀), May 17, 1931

(CRB, UC, ~~3 sheets each~~, distributed as *S. lasiolepis bigelovii*). ↗

(Hupa, Trinity River, Mrs. M. H. Manning, April-May, 1902 (UC).

Del Norte County, California.

Smith River at Roosevelt Highway Bridge, 5 miles above mouth, altitude 50 ft., gravel bars, Joseph P. Tracy 9499 (♀, low bush), 9500, 9501, and 9503 (all fol.), May 30, 1931 (UC). ↗

Smith River at Hiouchi Bridge, 8 miles below Gasquets, Shrub 6 ft. high in bouldery-sandy flood plain, Ball, Parks, and Tracy 01299, May 15, 1932 (CRB, UC, 3 sheets each). ↗

Smith River ("French Flats"), just below Gasquets, alt. 300 ft.

(90 m.), slender bush 10 ft. tall, ~~Joseph P. Tracy~~ 9360, May 10, 1931 (CRB, UC);

Slender tree, 6 m. high, ~~Joseph P. Tracy~~ 9362 (♀) and Parks and Tracy 0934

(both from same plant), May 10, 1931 (CRB 0934 only; UC); Slender, broad-

leaved tree, 3-6 m. high, Parks and Tracy 0942 (fol. finely pubescent), May 10, 1931 (CRB, UC; 2 sheets each); Densely branched shrub, 1-2.5 m. high,

in seepage water in sandy-gravelly soil, ~~Joseph P. Tracy~~ 9363 and Parks and

Tracy 0950 (♀, both from same plant), May 10, 1931 (CRB, UC); Shrubs about

10 ft. high, on bouldery-sandy margin of river, Ball, Parks, and Tracy 01295

(♀), 01296 (♀), and 01298 (♀), May 15, 1932 (CRB, UC). ↗

Smith River at Madrono Park, above Gasquets, shrub about 8 feet high, in bouldery alluvium at edge of water, Ball, Parks, and Tracy 01288 (staminate type collection), 01291 (pistillate type collection), May 15, 1932 (CRB, UC, several sheets of each).

4
SALIX FARRAE Ball

Plate 5 ~~70~~ 71

8 ft
9 Salix Farrae Ball, in P.C. Standley, in Contr. U.S. Nat. Herb. 22:321, 1921 (Flora of Glacier National Park, Montana).

lead
British Columbia
The first collections of this trim little species apparently were made by Miss Edith M. Farr at Field, in Yoho Park, southeastern B.C., on June 8, 1904, and June 7 and July 15, 1905. John Macoun was a close second with his specimen from nearby Emerald Lake, B.C., on Aug. 27, 1904. Of these specimens, only Miss Farr's second collection was ^{sufficiently} complete enough to permit a description of the species and it accordingly became the type. It ~~was~~ ^{is} a ~~real~~ pleasure to dedicate the species to this able and observant collector. Her paper ✓ on the flora of the Rocky and Selkirk

✓ Farr, Edith M., Contributions to a Catalogue of the Flora of the Canadian Rocky Mountains and the Selkirk Range, Contrib. Bot. Lab. Univ. ~~Penn.~~ ^a 3:1-88, 1 map, 1907.

Mountains of Canada was published long before this species was recognized and it ^{is} mentioned therein under S. cordata and S. glaucops (p.30). Only with the abundant collections of N.B. Sanson from Banff and vicinity, made available in 1919 and thereafter, has it been possible to determine the range of expression in this species and to prepare a complete description of both the pistillate and the staminate plants.

The treatment given in the Flora of Glacier National Park necessarily was brief and a projected monograph of the section Cordatae has been prevented. It seems desirable, therefore, to present the following more complete description of the species and of some varying forms.

Set solid
 Section Cordatae ↓

Caespitose shrub 3 cm. to 1.5 m. high; branches ascending; branchlets ascending or somewhat divergent, more or less puberulent to glabrous, reddish brown and shining, or drying a dull reddish brown, scarcely striated; the seasonal shoots pale yellow or reddish-yellow, thinly pubescent or puberulent to glabrate; budscales 2-4 or 6 mm. long, mostly obtuse, colored as the seasonal shoots, puberulent or glabrous or the mature ^{bud} scales pruinose (Malte & Watson 511).

Leaves small to midsized, slender-petioled; stipules wanting or occasionally 0.5-1.5 or rarely 3-6 (Sanson 2028) mm. long and semicordate; petioles slender, twisted, finely pubescent, or puberulent to glabrous, yellow or yellowish-brown; blades elliptical-oblongate to elliptic-oval, or broadly lanceolate (~~the~~ young lower ones often obovate and obtuse), usually widest just above the middle, acute to usually rounded or sometimes truncate at ~~the~~ base, acute or ~~those~~ on sterile twigs often abruptly short-acuminate and sometimes plicate at the apex, entire (or rarely the upper minutely glandular-serrulate), 1-1.8 cm. wide, 3-5.5 cm. long, or the largest 2.3-2.5 ^{(X) by} 6-7.5 cm. on sterile twigs, common sizes ^{as com.} being 1.4 x 3; 1.3 x 3.5; 1.4-1.7 x 4; 1.7-2.0 x 5, and 1.8-2.4 x 6 ~~cm.~~, yellowish green and rather dull above, subglaucous to usually strongly glaucous beneath, ~~the~~ veins above subimpressed when ~~the~~ leaves are young but somewhat elevated in age, those on ~~the~~ lower surface slender and becoming raised to form an open reticulation of slender veins.

Low shrub; branchlets reddish-brown and seasonal shoots yellowish, puberulent; leaves small, elliptical-oblongate to elliptical-oval, widest just ^{above} the middle, rounded at base, acute to abruptly short-acuminate at apex, entire, 1-2 cm. wide, 3.5-5 or 6 cm. long, yellowish-green, glaucous beneath, glabrous, veiny; aments small, coetaneous, on short, small-leaved peduncles, pistillate 2-3, staminate 1.5-2 cm. long; scales 1 mm. long, brown, thinly pilose to glabrate capsules 4-6 mm. long, glabrous; pedicels 1-1.5 mm. long, glabrous; styles 0.4-0.8 mm. long, entire; stigmas short; stamens 2, filaments free, glabrous.

116- 70

Det. S. S.

Aments coetaneous, short-pedunculate; pistillate peduncles 5-10 or rarely 15 mm. long, yellow during anthesis, becoming brown, glabrous or very thinly pilose-pubescent, bearing 2-3 or rarely 4 small leaves usually 1-1.5 or 2 cm. long; staminate peduncles 3-5 mm. long, bearing 2-3 small leaves 10-12 mm. long.

Pistillate aments 1-2 cm. long in anthesis, becoming 2-3 or rarely 3.5 cm. long and about 1 cm. wide in fruit; ~~the~~ rachis glabrate to thinly pilose; scales oblong or oblanceolate, 0.7-1 mm. long, obtuse, ~~the~~ lower portion yellowish, ~~the~~ apical portion dark brown, sometimes completely fuscous in drying, thinly pilose beneath or becoming glabrous throughout; capsule lanceolate-acuminate, often acute at base, 4-6 mm. long, glabrous, yellowish, sometimes becoming brown in age; pedicel yellow, glabrous, 1-1.5 mm. long, or on basal capsules sometimes 1.5-2 mm.; gland short, filiform-capitate; style 0.4-0.8 mm. long; stigmas usually very short, entire or sometimes one or both somewhat bifid.

Staminate ament short-pedunculate, 1.5 cm. long, slender, yellow; scales much as in ~~the~~ pistillate flower; stamens 2, filaments glabrous, free; anthers oval or subspherical, yellow.

lead

The staminate aments are but little known. Although many of the collections bearing only leaves probably are from staminate plants, they were made too late to obtain aments. Cusick's No. 3386a from the Imnaha Mts. of Northeastern Oregon, collected on August 18, bears one staminate ament with full-grown leaves. This doubtless represents a second or autumnal flowering and may not be fully representative of vernal flowers. Sanson's No. 117b from the vicinity of Banff, Alberta, is the staminate type specimen, and part of his 115a also is staminate. *no.* It is to be hoped that collectors will be enabled to obtain additional staminate specimens and later to get mature foliage from the same plants.

One striking feature of most of the pistillate specimens examined is the apparently frosted condition of the aments, ~~due to attack by a fungus~~ ^{resulting from an} ~~number~~ ^{these frosted specimens,} ~~the~~ ^{is} ~~percentage of the cases,~~ ^{specimens} ~~however,~~ ^{the} the ament is distorted and all or part of the capsules are blackened. Often the rachis and pedicels show injury. In many ~~cases,~~ ^{specimens} the ovaries have not been fertilized, although this condition could result from absence of male plants. Reproduction by seeds must be greatly reduced and possibly this is a factor in the apparently limited range of the species.

S. Farrae differs from S. Walpolei, its nearest relative, in ~~the~~ puberulent, rather than pubescent branchlets, ~~the~~ yellow rather than brown seasonal shoots, ~~the~~ smaller and narrower leaves, ~~the~~ shorter denser aments, ~~the~~ acuter capsules, and ~~the~~ longer, entire style.

7 Distribution.

Salix Farrae is a plant of wet places, chiefly swamps and marshes. It has been found sparingly in the Medicine Bow Mountains of southeastern Wyoming, the Yellowstone National Park of northwestern Wyoming, and the Wallowa and Imaha Mountains of northeastern Oregon. It occurs abundantly in the Glacier National Park of northwestern Montana, and northward along the Rocky Mountain ranges as far as Lake Louise in the Rocky Mountains Park of Alberta, and Wapta and Emerald Lakes in the Yoho Park of British Columbia. This carries it north nearly to latitude $51^{\circ}30'$. Very probably its known range will be extended as more collecting is done in the northern mountains. It occurs at relatively high altitudes, varying from 7000 or 8000 feet in the southern portion of its ranges to 5000 or 6000 feet in Glacier Park and 4000 to 5000 in the Canadian Mountains. Its zonal distribution is upper Transition and Canadian. The following specimens have been studied. The abbreviations used for the containing herbariums are: AA, Arnold Arboretum; CAS, California Academy of Sciences; CRB, Carleton R. Ball; NMC, National Museum of Canada; UC, University of California, and USN, U.S. National Herbarium. RMP, Rocky Mountains Park (Banff);

UAC, Utah Agricultural College;

Wyoming.

✓ Albany Co. Open parks, Nash's Fork, Medicine Bow Mts., A. Nelson 7824, July 30, 1900 (✓ UC). Yellowstone National Park, Obsidian Creek, in small clumps 2-6 ft. high, A. and E. Nelson 6098 (CRB); on a boggy slope, 3-4 feet high, A. and E. Nelson, 6104 (Mus. Paris, USN), both July 24, 1898. Upright shrub, on exposed hillsides, Upper Reynolds Creek, elev. 5300 ft., Montana, Bassett Maguire 474, July 20, 1932 (UAC).

✓ Glacier National Park Along Apekunny Creek, 2-3 ft. high, in open mossy bog, P.C. Standley 16930, Aug. 2, 1919 (CRB, USN). Vicinity of Cracker Lake, alt. 1740 to 1920 m., common, on rock slides above lake, Standley 15755 (USN); moist place at foot of cliff, 3 feet high, 15813 (CRB, USN), July 15, 1919. Vicinity of Grinnell Glacier, alt. 1650-1950 m., 2-4 feet high, common on rocks near brook, Standley 16753 (CRB, USN), July 31, 1919. Vicinity of Grinnell Lake, alt. 1500-1650 m., in marsh; 3 feet high, Standley 16109, 16110, July 21, 1919 (CRB, USN). Along Swiftcurrent Creek, below Lake McDermott, alt. about 1350 m., 1-2 feet high, abundant in open marsh, Standley 16058, July 20, 1919 (CRB, USN).

Oregon.

✓ Wallowa Co. Shrub 3-5 feet high, on the Imnaha R. alt. 7000 ft., W.C. Cusick, 3386, 3386a, Aug. 18, 1909 (CRB as S. monticola Bebb; USN, on sheet 622467 as a mixture with Cusick 3383, S. melanopsis). Wet, higher Wallowa Mts., near the lake, a low shrub, W.C. Cusick 2302 (as S. commutata denudata), Aug. 2, 1899 (USN, four small immature twigs, 3 pistillate and 1 staminate, probably all belonging to farrae, and, if so, one pistillate twig representing variety microserrulata Ball).

Alberta.

✓ Margins of streams, Oldman River, W. Dawson 24334 (as S. cordata), Aug. 7, 1883 (NMC). Rocky Mountains Park. Elbow River, J. Macoun 41, June 23, 1897 (CRB, NMC, 94441, as S. lutea). Banff and vicinity, Lake back of Mt. Assiniboine (20 mi. S.W. of Banff), N.E. Sanson 811, 813, 816, Aug. 26, 1921 (CRB, RMP). Swampy ground to Calumet Camp, Banff, Sanson 803, July 29, 1924 (CRB, RMP); Museum Grounds, back of cages, Sanson 95,

132, 134, 180, June 9, 10, 19, 21, 1911 (CRB, RMP); By the Spray River,
~~N.B.~~ Sanson 108, June 9, 1911 (CRB, RMP), pedicels up to 2 mm. long);
 Damp places, Cave Avenue, Macoun 24337, June 26, 1891 (NMC, as S. cordata
 var.); River Avenue, ~~N.B.~~ Sanson 336, Aug. 2, 1911, and 2032, Aug. 12,
 1911 (CRB, RMP); Cascade Mtn. (about 5 miles north of Banff), 2028, and
 2207 (Cascade Camp), Aug. 26, 1916 (CRB, RMP), and 2027 (amphitheatre),
 Sept. 2, 1916 (CRB, RMP); Side of 40-mile Creek, Sanson 2048, June 13,
 1900 (CRB, NMC 25358 as S. cordata, RMP); Without specific locality,
~~N.B.~~ Sanson 228, June 29, 1911 (CRB, RMP), 241, 315, 317, 318, and 322,
 all July, 1911 (CRB, RMP), 338, 359, 386 (smaller, obovate leaves), 390,
 415, 440, 2034, all August, 1911 (CRB, RMP); Mud Lake, 12 miles out
 (from Banff), on way from Spray Lake to Kananaskis Lake, ~~N.B.~~ Sanson 115a,
 117b (staminate), June 30, 1928 (CRB). Palliser Pass, alt. about 7000 ft.,
~~N.B.~~ Sanson 503, July 29, 1922 (CRB); Castlemount Ranger Station, in
 swamp about 3 miles east, alt. 4300 ft., Malte and Watson 508, 511 (ovate-
 obovate leaves), 513, June 21, Sept. 4, 1925 (CRB, NMC, 116774, 116777,
 116779; UC); Upper end of Lake Louise, alt. 5700 ft., Malte and Watson
 1081, July 9, 1925 (CRB, NMC, 116813); 2-4 ft. high, near chateau at Lake
 Louise, J.G. Jack 2927, as S. Barclayi, Sept. 18, 1922 (AA). Moraine Lake,
 W.A. and C.B. Setchell, Aug. 8, 1923 (UC).

Nordegg District: In sphagnum muskeg, near Sunbeam Cabin, Nordegg River, A.H. Brinkman 3733, July 28, 1928 (CRB).

British Columbia

Yoho Park: Emerald Lake, J. Macoun 68901, as S. cordata var.,
 Aug. 21, 1904, (CRB, NMC); Field, along the Kicking Horse River, on the
 flats which are often overflowed in July, when snows melt, Edith M. Farr
 558, June 7, July 15, 1905 (CRB, pistillate type); Edith M. Farr (as a mix-
 ture with S. glauca glabrescens), June 8, 1904 (CRB); North side of Wapta
 Lake, J. Macoun 68900, S. cordata var., Aug. 2, 1904 (CRB, NMC); Burgess
 Pass trail, alt. 6500 ft., shrub 3 ft. high, Titus Ulke, July 28, 1922 (Ulke).

S. Farrae microserrulata, ~~new variety~~

→ This variety differs from the species in having the margins of the leaves shallowly but not always regularly serrulate, or sometimes crenulate-serrulate. The blades ~~themselves~~ tend to be a little narrower than in the species.

On many shoots of typical Farrae the apical leaf or leaves may be somewhat serrulate. This is true also of the apical leaves of some other species with normally entire margins, as S. planifolia Pursh. Occasionally, however, a specimen has all or nearly all ~~of~~ its leaves with the margins finely and regularly serrulate. Such specimens do not seem to differ in other respects from typical Farrae, though this is not wholly certain. ~~Most~~ ^{The majority of} such specimens are without fruit or have only unfertilized capsules. It seems desirable to designate these as a variety of the species because the consistent serrulation changes the aspect of the leaf materially and requires recognition in the keys. The following specimens are placed here.

ALBERTA. Rocky Mountains Park, Banff and Vicinity

Springy thickets, Sundance Canyon, near Banff, alt. 4500 ft., M. O. Malte and W. R. Watson 898, July 4, 1925 (CRB, pistillate type; NMC, 116806); Swamp, Canyon Road, N.B. Sanson 1 x, Aug. 21, 1911 (CRB, RMP); ^{270, July 5, 1911 as S. pseudo-monticola,} without specific locality, - N.B. Sanson 327, July 27, 1911, 328 (capsules to 7 mm. long), July 28, 1911, 340, Aug. 3, 1911, 395, Aug. 16, 1911, and 2040, Aug. 10, 1911 (all CRB, RMP).

9 Marginibus foliorum serrulatis aut crenulato-serrulatis.

etc
Sp | SALIX SETCHELLIANA sp. nov.

Plate 6 *7472*

Description.

not solid

Sectio Herbaceae (Retusae). Frutex prostratus aut decumbens sparse ramosus; ramulis gracilibus, paucifoliosis, juvenis albo-hirsutis; foliorum laminis anguste usque ad late oblanceolatis, 2-6 cm. longis, basi cuneatis, apice acutis usque ad retusis, irregulariter glanduloso-crenulato-serrulatis; amentis coetaneis, 1.5-2 cm. longis, folioso-pedunculatis; squamulae florum obovatis, 3-4 mm. longis, plerumque retusis, ^{pallide} luteis, glabris; staminibus 2, filamentis liberis, basi sparse pilosis; capsulis lanceolatis, 6-7 mm. longis, subsessilibus, glabris; stylis stigmatibusque 0.2-0.3 mm. longis.

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~~Section Herbaceae (Retusae). Prostrate or decumbent sparingly-branched shrub; branchlets slender, ^{few-leaved,} the younger white-hirsute; leafblades narrowly to broadly oblanceolate, 2-6 cm. long, cuneate at base, acute to rounded to retuse at apex, irregularly glandular-crenulate-serrulate; aments coetaneous, 1.5-2 cm. long, leafy-peduncled; flower scales obovate, 3-4 mm. long, mostly retuse, yellow, glabrous; stamens 2, filaments free, thinly pilose at base; capsule lanceolate, 6-7 mm. long, subsessile, glabrous; style and-stigmas 0.2-0.3 mm. long.~~

~~SALIX SETCHELLIANA Ball n. sp.~~~~Plate~~

Set solid

Prostrate or decumbent sparingly branched shrub, branches slender, 2-5 cm. long, 0.5-2 mm. in diameter, usually more or less tortuous, ~~the~~ older glabrate and sometimes subglaucescent, ~~the~~ younger white-hirsute, or ~~the~~ late seasonal shoots glabrate; bud ~~#~~ scales inconspicuous, 2-4 mm. long, densely white-hirsute.

Leaves exstipulate, scarcely petioled; stipules wanting (in specimens seen); petioles obsolete to 1-2 or rarely 3 mm. long, broad, stout, channeled above, almost clasping, broadening imperceptibly into the cuneate base of the blade, yellow, glabrous, or sometimes more or less white-hirsute; blades small, 3-5 or rarely 6 ^{to 8} per branchlet, mostly narrowly to broadly oblanceolate with cuneate base tapering imperceptibly into ~~the~~ short or almost obsolete petioles, ~~the~~ lower and smaller sometimes elliptical-oblanceolate or obovate and less cuneate at base, ~~the~~ narrow apical ones acute, ~~the~~ others rounded or shallowly to deeply emarginate to retuse at apex, 1.5-5 or 6 cm. long, 0.8-1.5 or 1.8 cm. wide, common sizes ^{in cm.} ~~being~~ 1.5 by 0.6-0.8, 2 by 0.9-1, 2.5 x 1.5, 3 x 1.1-1.5, 3.5 by 0.8, 3.5 by 1.1-1.4, 4-4.5 by 1, 4 by 1.3-1.7, 4.5 by 1.5, 5 by 1, 5 by 1.3, 5.5 by

Dist. Solid
1.7, and 6 by 1-1.2, thick, firm, chartaceous, margins irregularly and remotely to rather closely, shallowly to rather deeply glandular, crenulate-serrulate, veins diverging at angles of ^{from} 20° ^{to} 40° and straightish in their lower portions, curving inward gently toward apex, mostly plane, yellowish-green and glabrous above, and more or less white-hirsute while unfolding, paler, somewhat glaucescent, and glabrous beneath in age, or the hairs more or less persistent on the midrib and primary veins.

Aments costaneous, 1.5-2 cm. long, mostly 12- to 18-flowered, terminating short (0.5-1.5 or 2 cm. long) white-hirsute to finally glabrate or glabrous, seasonal branchlets bearing 2-3 normal leaves; flower scales broadly oblanceolate, obovate, or obconic, often appearing oblong in pressed specimens, because the margins become ~~infolded~~ ^{folded} around the stamens, rounded to truncate or commonly retuse or bicuspidate at apex, 3-4 or 4.5 mm. long, finely striate with sometimes branching veins, persistent, glabrous, pale yellow or straw color.

Staminate aments slender, 1.5-2 cm. long, yellow; stamens 2, filaments little exceeding the scales, free, thinly pilose on the lower one-fourth to one-third; anthers oblong, drying linear, and superficially resembling stigmas when protruding from beneath the elongated scales; pistillate aments oblong to broadly oblong; capsules broadly lanceolate, 6-7 or 7.5 mm. long, bluntish at apex, rounded at base, subsessile, thick, brown, glabrous; pedicel stout, 0.1-0.3 mm. long; style (from over-mature specimens) stout, 0.2-0.3 mm. long; ^{stigmas} apparently as short; gland 1, ventral, slender, 0.8-1 mm. long, somewhat capitate.

It is both a pleasure and an honor to dedicate this unusual species to Professor William A. Setchell, ~~senior~~ and efficient head of the Department of Botany, University of California, and his charming wife, Mrs. Clara B. Setchell. Their extensive, arduous, and discriminating collecting of more than 670 ⁱⁿ ~~members~~ of willows in Alaska and adjacent portions of British Columbia and Yukon Territory in 1931 and 1932 has made possible an adequate treatment of the genus as it occurs in that region. ^{through study these} ~~Already it has~~ ^{have been added} ~~added several species and varieties~~ ^{been made possible} to the known flora and ^{has} placed the botanical world under a large debt of appreciation.

^{here} To Mrs. Ynes Mexia belongs the credit for the first discovery of this species, in 1928. The collection consisted of pistillate material long past maturity of the fruit. It was not possible to delimit the species until the collection of abundant staminate material by Dr. and Mrs. Setchell and of equally abundant pistillate material in somewhat better condition for study, by Mr. David Kaye, at Dr. Setchell's request.

Salix Setchelliana is abundantly distinguished from any other American species of the Herbaceae - Retusae group. The large leaves, ^{from} 2-6 cm. long, with the margins more or less irregularly and shallowly glandular-crenulate-serrulate, differ completely from the small leaves of the other species, ^{which are} usually from 5-15 mm. ^{wide} long and rarely exceeding 2 cm. in length. Those of ^{polaris} ~~phlebophylla~~ and rotundifolia are entire, while those of herbacea and uva-ursi are finely and evenly crenulate. The large (3-4 mm. long) yellowish and glabrous flower scales also are distinctive. Of the Old World species of the section, it probably is most closely related to S. retusa L., from which it differs ⁱⁿ ~~by~~ the much larger ^{leaves, with} glandular-crenulate ~~leaf~~ margins.

Distribution -

at slide
Salix Setchelliana is known at present only from Mt. McKinley National Park in Central Alaska, and from the district between Lake Kluane and the Don Jek River on the east side of the St. Elias Range in southwestern Yukon Territory. It seems probable that it will be found to be distributed more widely in the mountains of northwestern North America. The type locality is the snout of the Muldrow Glacier at the base of Mt. Eielson in Mt. McKinley National Park, Alaska.

The specimens which have been examined are listed below. ~~The initials designating the various containing herbariums are as follows:~~ CRB, Carleton R. Ball; PANS, Philadelphia Academy of Natural Sciences; UC, University of California. Mexia No. 2095 has been distributed to some 18 of the leading herbariums of the United States and Europe. Specimens are listed below only for those in which the writer has seen the material. Specimens of the type collections, pistillate and staminate, will be distributed presently to about 25 of the leading herbariums of the world. The writer personally has examined all the specimens but cannot list the ~~containing~~ ^{the} herbarium because the distribution has not yet been ~~made~~, *completed*.

YUKON TERRITORY: Lake Kluane to Don Jek River (southwestern Yukon, on east side of St. Elias Range), Adolf Müller, August 11-27, 1920 (PANS, distributed as Salix Farrae ?).

ALASKA: Mt. McKinley National Park, central Alaska! Shrub on gravel bar in riverbed, near foot of Copper Mountain, Thoroughfare Pass, alt. 1000 m., Mrs. Ynes Mexia 2095, July 12, 1928 (CRB, PANS, UC; distributed unnamed; post-mature fruit); Low or prostrate shrub scattered in moist gravel of an area 30-40 ft. in diameter at snout of Muldrow Glacier, opposite ranger cabin ("Copper Mtn. Camp"), base of Mt. Eielson, elev. about 3000 ft., William A. and Clara B. Setchell 587 (staminate type collection) July 12, 1932 (CRB, UC; type specimens, just past flowering); * same place, David Kaye 1 (pistillate type collection), about Aug. 31, 1932 (CRB; UC, type specimen, *Hand* sheets Nos. 504076, 504077, 504078).

clc
SALIX BRACHYCARPA variety Mexica Batt., new variety. *8/4*

Plate 72-73

set seed
 Prostrate or spreading shrub, 3-5 or 7 dm high; older stems dark gray or brownish gray, roughened with bud scars, branching freely at top of stem; the branchlets mostly divaricate, sometimes ascending, very leafy, the free apical branching and leafiness giving a topheavy aspect to specimens; 2-year and 1-year shoots dark brown, full of leaf scars, sparsely or ~~the~~ 1-year more densely pilose-pubescent, seasonal shoots more or less densely white-pilose; bud scales short, oval, about 2 mm. long, obtuse, chestnut or yellowish-brown, pilose-pubescent or becoming glabrate

Leaves small, short-petioled, rarely stipulate; stipules wanting or minute, up to 2 or 3 mm. long on vigorous shoots, lanceolate, acute, pilose; petioles stoutish, 2 or sometimes 3 mm. long, pubescent; blades small, mostly elliptical, or elliptic-oblong, sometimes elliptic-lanceolate or elliptic-oblong, 2-3.5 or 4 mm. long, 7-10 or 14 mm. wide, common sizes being 20 by 8, 25-30 by 7-10, 30-40 by 7-14, and 35 by 12 mm., obtusish (the broader) to acute or abruptly acute at the apex, usually rounded but sometimes somewhat narrowed at base, often minutely and rather remotely glandular-denticulate on the lower portion of the margin, ~~the~~ yellow midrib and primary veins usually prominent beneath and sometimes raised on the upper surface, the cross veinlets often forming a fine reticulation beneath, and occasionally above, yellowish green above, glaucous to densely glaucous beneath, the young soft-pilose with white hairs on both surfaces, becoming glabrate to glabrous with maturity, especially beneath, but the margins always ciliate permanently.

set seed
 Sectio Glaucæ. Pedunculis 1-2.5 cm. longis; amentis elongatis, laxis, circa 20-floriis, staminatis 1-2 cm. longis, pistillatis 2-3.5 cm. longis; a forma typica per et pedunculos longiores et amenta longiora laxioraque abludens.

serotina
 Aments coetaneous or subserotinous, leafy-pedunculate, lax; peduncles relatively long, slender, pilose-pubescent, the staminate 1-1.5 cm. long, the pistillate 1.5-2.5 cm. long, both bearing 3-6, usually 4, leaves; ^{scales} obovate-oblong when expanding, becoming narrowly oblong or oblanceolate, obtuse, 1.5-2 mm. long, pilose, yellowish throughout or darkened at ~~the~~ tips, sometimes ^{brownish} ~~fuscesc~~ throughout; pistillate aments oblong, 2-3.5 cm. long, 1.2 cm. wide, lax, about 20-flowered; capsules narrowly lanceolate, 6-7 mm. long, subsessile or the lowermost distinctly pedicelled, the ovaries white-pilose, ~~the~~ mature capsules yellowish, thinly pilose; pedicels nearly obsolete or those of ~~the~~ lower capsules up to 0.5 mm. long. stoutish, pubescent; styles mostly entire or occasionally divided at ~~the~~ apex, 0.7-1 mm. long; stigmas usually divided, about as long as ~~the~~ styles; staminate aments 1-1.8 cm. long, lax, oblong; stamens 2, ~~the~~ filaments free, glabrous or sparingly pilose at base for one-fourth to one-third of ~~their~~ length.

lead
 Variety Mexiae differs from the typical species chiefly ⁱⁿ by the longer peduncles, 1-2.5 cm. long; the elongated, lax, oblong aments, the pistillate 2-3.5 cm. long in fruit and about 20-flowered; the staminate 1-2 cm. long, lax, oblong.

This probably is the plant mentioned by Schneider (Bot. Gaz. 66: 337, 1918) in his discussion of S. brachycarpa Nuttall, in the following words:

reduced
 8-10-26
 "An uncertain form is represented by no. 74. Hb. H.B. and T. (fr.: N.), named S. desertorum var. acutifolia. It differs from the type by foliis subacutis ad 32:9 mm. magnis et praecipue ament- is fructiferis satis laxifloris ad 3.5:1 cm. magnis."

Distribution.

Salix brachycarpa was not known to occur in Alaska when Coville monographed the willows of the Territory in 1901. ~~Shneider, in 1912 (Bot. Gaz. 8-)~~, indicates that the range extends into Alaska but gives no specimens. (The material in hand at the present time indicates a limited range, though future exploration may greatly broaden it. The following collections have been examined. ~~The initials of the containing herbariums are as follows: CAS, California Academy of Sciences; CRB, Carleton R. Ball; PANS, Philadelphia Academy of Natural Sciences; UC, University of California, and USN, United States National Herbarium.~~

BRITISH COLUMBIA. Lake Atlin District: Shrub, 2-3 ft. high, edge of hydro-magnesite swamp, Atlin, W.A. Setchell and H.E. Parks 11 (staminate and pistillate), July 10, 1930 (CRB, UC, 2 sheets, too young for certain determination); Mt. Monarch, near Atlin, Setchell and Parks 12, July 11, 1930 (CRB, UC); Warm Springs, 20 miles south of Atlin, Setchell and Parks 13, July 9, 1930 (UC).

YUKON TERRITORY. Carcross (near Lake Bennett), Alice Eastwood 722 (staminate), July 16, 1914 (CAS, USN; apparently about 3 dm. high, ~~the~~ branchlets and leaves glabrate, ~~the~~ peduncles less than 1 cm. long, CRB); 723 (pistillate), July 16, 1914 (CAS, USN; branchlets and leaves glabrous except for ciliate leaf margins, peduncles 1 cm. or less, aments dense but laxer at base; both distributed unnamed). Cowley, Yukon River, elev. approx. 2400 ft., W.A. and C.B. Setchell 323 (too immature for certainty) and 330, June 14, 1932 (CRB, UC). Dawson: Dawson Slide, Alice Eastwood 81 (May 19), 161 (June 7), 1914 (CAS, distributed unnamed; apparently a low and much-branched plant, ~~the~~ leaves very small, 8-18 mm., glabrous except the ciliate margins, peduncles less than 1 cm. long but not yet fully developed).

ALASKA. McKinley National Park: Prostrate shrub, up to 30

cm. high, forming dense thickets, rock (moraine)-covered snout of Muldrow

Glacier, alt. 1000 m., Ynes Mexia 2131 (pistillate type collection; CAS, CRB;

type, ~~sheet~~ *Nos. 384376, 441340, and 441341*;
UC, USN), 2132 (Staminate type collection), July 23, 1928 (CAS, UC (type *sheet*))

distributed as S. niphoclada Rydberg); ~~14~~ ^d Spreading shrub, 7.5 dm. high, on

gravel bar in McKinley River, on trail from Wonder Lake to McKinley Bar, near

center of north boundary of Park, alt. 700 m., Ynes Mexia 2270 (pistillate),

Aug. 22, 1928 (CAS, UC, distributed unnamed); ~~14~~ ^d Spreading shrub, 30 cm. high,

on rock slide, on precipitous slope above camp, Toclat River, at upper edge

of brush line, alt. 800 m., Ynes Mexia 2282 (pistillate), Aug. 23, 1928 (CAS,

PANS, UC, distributed as S. glauca); ~~14~~ ^d Spreading shrub, up to 7.5 dm. high,

open spaces in spruce woods on flat north of Savage Camp (on Savage River),

alt. 900 m., Ynes Mexia 2083 (pistillate), 2084 (staminate), July 6, 1928

(CAS, CRB, PANS, UC, USN, both distributed as S. glauca); ~~14~~ ^d Savage River

Camp, elev. 2650-2700 ft., W.A. and C.B. Setchell 159, June 28, 1931 (UC).

Yukon River, Fort Yukon, moist road in open spruce-aspen woods, L.F. Hen-

derson 15045, 15046, Aug. 7, 1932 (CRB).

No. 384375,

867
SALIX BRACHYCARPA var. SANSONI n. var.

solid
Sectio Glaucæ. A forma typica per folia breviora latioraque, late elliptica usque ad ovata et apice acuta, aut occasione oblata obovata et apice obtusa, 10-20 mm. usque ad 25 mm. longa, 5-9 mm. usque ad 12 mm. lata abluens.

Sectio Glaucæ. Low, erect or ascending shrub, 2-5 or 7 dm. high; bark reddish brown; branchlets numerous, ~~the~~ epidermis peeling off in papery flakes, those of the season pubescent; buds ovate, obtuse, 1 mm. long, pubescent; leaves small; petioles scarcely exceeding 1 mm.; blades mostly broadly elliptical or ovate and acute at apex, occasionally obovate and obtuse at apex, rounded at base, entire, 5-9 or 12 mm. wide, 10-20 or 25 mm. long, at first distinctly villose-tomentose with yellowish hairs, becoming glabrous and somewhat shining above and somewhat glabrescent and glaucescent beneath, veins raised on both surfaces but more distinctly so above.

pet. pubescent
Aments small, globular, about 1 cm. in diameter, subsessile, bracteate, 12-15- or 20-flowered; capsules subsessile, 4-5 or 6 mm. long, obtuse, softly yellowish-tomentose; style about .7 mm. long, stigmas notched; stamens 2, filaments pubescent at base.

leaf
Variety Sansoni differs from the species chiefly in the smaller size of the plant and all its parts, especially in the shorter and relatively broader leaf blades, and the subsessile, nearly globular aments. The elliptic-ovate or obovate blades, 1-2 cm. long, contrast with the mostly oblong to broadly elliptical blades, 2-5 cm. long, and the subsessile roundish aments contrast with the plainly peduncled and elongated aments, of the species.

leaf
It is a pleasure to associate with this ~~handsome~~ little northern willow the name of Mr. N. B. Sanson, long-time curator of the Government Museum in the Rocky Mountains National Park, Banff, Alberta, Canada. His tireless energy and enthusiasm have made the flora of that most interesting district much better known than formerly. The type collection was made by him in British Columbia, as listed in the specimens examined, and he has made other collections in the adjacent portion of Alberta, around Banff.

7 Distribution. -

set seed
This variety occurs sporadically in extreme northeastern Oregon, is fairly common in the Rocky Mountains Park of southwestern Alberta, apparently less common in the adjoining mountainous area of British Columbia, and reappears in the Gaspé district of eastern Quebec, which has been so well explored and described by Fernald. The species ranges from Colorado and Utah northward in the Rocky Mountains to the Mackenzie River, and eastward to Hudson Bay. In the far north, Yukon and Alaska, it is represented by variety Mexiae.

The initials used to designate the herbariums containing the specimens cited are: CAS, California Academy of Sciences; CRB, Carleton R. Ball; GH, Gray Herbarium of Harvard University; NMC, National Museum of Canada; RMP, Rocky Mountains Park Herbarium at Banff; UC, University of California. 7 The following specimens have been examined.

OREGON. Wallowa Mountain ^{On mountain} sides near the Lake, 8000 ft. alt., Wm. C. Cusick 2298, July 31, 1899 (UC).

BRITISH COLUMBIA. Starbird Glacier Valley, Lake of the Hanging Glacier, Windermere, District, N. B. Sanson 118 (CRB, RMP) ^{and} 119 (CRB, RMP, UC), both July, 1928. No. 119 is the type collection, containing both male and female plants, the latter being the specific type. The specimens in the herbarium of ~~the~~ C. R. Ball are the type specimens.

ALBERTA. Rocky Mountains Park, Banff, N. B. Sanson 375, August 11, 1911 (CRB, RMP); Sanson 389, Aug. 15, 1911 (CRB, RMP); M. O. Malte 122183, 122190, July 9, 1918 (NMC, UC); North side of Wapta Lake, John Maccoun 68887, Aug. 2, 1904 (CRB, NMC). In muskeg, Mercoal, near Coalspur, alt. 4300 ft., Malte and Watson 116891, 116893, Aug. 8, 1925 (NMC, UC).

QUEBEC. Wet serpentine barrens, alt. about 1060 m., tableland of Mt. Albert, Gaspé Co., Fernald, Griscom, Mackenzie, and Smith 25663 (CRB, GH), July 24, 1923. (The leaf-blades of this specimen are much more densely tomentose than are those of the western plants.) The sheet of No. 25667 in the herbarium of University of California, collected by the same persons at the same time and place, bears one ample specimen of the species and one 10-cm. branchlet of this variety (UC).

84 / SALIX GLAUCA, variety ALICEAE new var.

Ball new or little known W. American Salix
Salix glauca acutifolia (Hooker) Schneider (in part),

Schneider in Bot. Gaz. 66: 326-329, 1918; ibid. 67: 60-62, 1919;

Schneider in Jour. Arnold Arb. 3: 114, 1921.

Description

Sectio Glaucæ. A forma typica per folia elliptico-oblonga usque
as ovata, oblongo-ovalia, aut obovata, basi late rotundata, usque ad inter-
dum subcordata, (sed nunquam cuneata) ablutens; pedicellis capsularum longior-
ibus, 1-1.5 mm. longis; stylis plerumque integris.

Branchlets more or less, often densely, white-villous, those of the season
usually densely white-villous, the 1-year less so; stipules usually broader
than in the species, 4-5 by 2-3, or ~~the larger~~ 8 by 4 mm., or the larger 20 by 10
mm., somewhat semicordate and dentate near the base, mostly pilose; petioles 5-8
mm., or up to 12 mm. on seasonal shoots, pilose to villous; blades elliptic-
oblong to oval, oblong-oval, or obovate, base broadly cuneate while developing to
mostly broadly rounded or occasionally subcordate to cordate, apex acutish to
abruptly acute to obtuse, 3.5-5 by 1.5-2, up to 5-6 ^{or 7} by 2.5-3 or 3.3 cm., more or
less pilose on both surfaces, never becoming glabrate.

Aments inclined to be dense, 2-6 cm. long; scales as in the species but us-
ually more densely white-villous; filaments glabrous or sparsely pilose at base,
free or united for one-half to one-third their length; capsules more elongated,
8-10 mm. long, usually densely white- or grey-villous or tomentose; pedicel long-
er, 1-1.5 mm. long; styles entire or rarely the apex divided, about 1 mm. long;
stigmas divided, 0.6-0.8 mm. long.

lead
This variety ^{*inclines*} ~~varies~~ toward S. cordifolia in the broader and sometimes subcordate bases of the leaves, in the longer capsules (8-10 mm.), and in the usually undivided styles. It differs from glauca ^{*in*} ~~by~~ these three characters ^{*in*} ~~and by~~ the usually broader stipules. Its relationship to S. glauca is shown by the erect habit, the usually stout and straight branchlets, the large stipules and leaves, and the long stout aments, as well as by the rather copious long white hairs on the branchlets.

Schneider (Bot. Gaz. 67: 61, 1919) has described a forma pol-
iophylla of the variety, S. glauca acutifolia (Hooker) Schneider. He cites under it only the type specimen, Preble and Preble 139 (cited below), and states that 6 other collections from the Slave Lake district of Mackenzie Territory, namely, Preble and Preble 141, and E.A. Preble 194, 196, 198, 330, and 332, look intermediate between his new form and the variety acutifolia. He suggests ^{*also*} ~~further~~ (p. 62) that on further investigation these plants might prove to be a new form "more closely related to cordifolia." The plant, how-
ever, seems to be closely connected with S. glauca, ^{*in*} from which it differs ~~by~~ more measurable characters than hairiness.

The variety seems to be confined to the eastern part of the range of glauca in North America. The specimens cited below come mostly from the Upper Yukon Valley in Yukon Territory and the upper Mackenzie ~~river~~ Valley in the district about Great Slave Lake. It is difficult to separate it with certainty from glauca when the leaves are just expanding. It is probable, therefore, that some of the specimens listed as S. glauca really represent this variety in stages too juvenile for certain determination. ~~The initials of the containing herbariums are as follows: CAS, California Academy of Sciences; CRB, Carleton R. Ball; PANS, Philadelphia Academy of Natural Sciences; UC, University of California, and USN, United States National Herbar~~

MACKENZIE TERRITORY. Fort Resolution: Edward A. and Alfred E. Preble 141, July 4, 1901 (USN, branchlets densely pilose-hirsute; leaves oblong, the upper subcordate at base); ~~+~~ ~~Edward~~ A. Preble 194, 196, 198, June 21, 1903 (USN, 194 immature, the others juvenile; Rydberg has annotated all three: "Near S. niphoclada Rydberg, but with much broader and shorter leaves, - fide P.A. Rydberg"). Fort Good Hope, ~~Edward~~ A. Preble 330, 332, July 23, 1903 (USN, juvenile; determined as "S. niphoclada Rydberg, - fide P.A. Rydberg").

YUKON TERRITORY. Yukon Valley: Whitehorse, Alice Eastwood 614 (type), July 12, 1914 (CAS, pistillate type; USN); ^{and} ~~+~~ August Kutsche, May, 1916 (CAS, 2 sheets, staminate type); ~~+~~ common, R. S. Kellogg, July 14, 1909 (USN, fruit); ~~+~~ Flats around Whitehorse, elev. about 2100 ft., W.A. and C.B. Setchell 336, June 15, 1932 (CRB, UC). Bush 5 ft. high, along W.P. & Y.Ry., 16 miles south of Whitehorse, elev. 2700 ft., R.S. Kellogg, July 13, 1909 (USN, fruit). Shrubs 2-2.5 ft. high, decumbent at base, on right bank at Tantalus Coal Mines, near Carmacks, elev. about 1600 ft., W.A. and C.B. Setchell 368, 368a, June 16, 1932 (CRB, UC). Tall sprangly shrub on left bank ⁶ ~~six~~ miles below Selkirk, alt. about 1300 or 1400 ft., W.A. and C.B. Setchell 370, June 16, 1932 (CRB, UC). Bank of Little Salmon River, shrub 8 ft. high, Victor Duran 2038, July 4, 1928 (CRB). Hard-luck Slough, Alice

Set solid

Eastwood 558, July 10, 1914 (CAS, USN, fruit). On island 20 miles below Dawson, Arthur J. Collier 1, June 16, 1902 (USN, leaves immature, tending to be broader and more obovate). Dawson, Alice Eastwood 504, July 2, 1914 (CAS, 2 sheets; USN, vigorous seasonal shoots, with large, broadly elliptical-ovate or subobovate leaves); Dawson, elev. 1000-9000 ft., W.A. and C. B. Setchell 377, June 17, 1932 (CRB, UC); Dawson, M. O. Malte 122158, Aug. 7, 1916 (UC). 24-Miles House, Alice Eastwood 386, June 25, 1914 (CAS, USN; young leaves narrow but broad-based, filaments united for one-half or one-third their length, glabrous). Hootalinqua, Lewes River, R. S. Kellogg, July 16, 1909 (USN, shoots thinly pilose; leaves mature, broad and short, elliptic-obovate, acute or obtuse).

ALASKA. Central District: Mt. McKinley National Park, Sable Pass, elev. 3700 ft., W.A. and C.B. Setchell 179, June 29, 1931 (CRB, UC, immature and identification not certain). Healy, elev. 1369 ft., W.A. and C.B. Setchell 150, June 28, 1931 (CRB, UC). West-Central District: Norton Sound, Stuart Island, South side near Chilnit Bluff, Charles H. Rouse 24, July 29, 1931 (CRB).

UNIVERSITY OF CALIFORNIA PRESS
BERKELEY, CALIFORNIA

November 20, 1933

Mr. C. R. Ball
117 Library
Campus

Dear Mr. Ball:

At a meeting of the Editorial Committee on November 10, 1933
your manuscript entitled

New or Little-Known West-American Willows

was approved for publication, subject to the following conditions:

(1) The acceptance of a paper by the Editorial Committee is understood to make it the property of the University, and it may not be withdrawn without the consent of the Committee, although usually consent will be given upon presentation of reasonable grounds for withdrawal.

(2) Authors will be allowed for changes in proof (including editorial changes) an amount equal to fifteen per cent of the original cost of composition. Changes in excess of this amount will be made at the author's expense; but no charge will be made for amounts less than one dollar. Changes due to causes independent of author or editor (as, for instance, those made necessary by inserting page references after page proof, or by change of order of a paper in its volume) will not be charged against the author.

(3) Authors will be granted fifty free copies.

(4) Another one hundred and fifty free copies may be granted upon recommendation of the editor or editors of the series, if approved by the Editorial Committee and provided application be made before papers are sent to press.

(5) Additional copies may usually be obtained by the author at cost of paper, printing, and binding, if he orders them before the paper is sent to press.

(6)

Very truly yours,

S. T. Farguhar

Secretary, Editorial Committee

November 20, 1933

May 8, 1934

Mr. C. W. Ball
My library
Berkeley

Dear Mr. Ball:

Mr. S. T. Farquhar

At a meeting of the Editorial Committee on November 10, 1933
University of California Press

Your manuscript entitled

Berkeley, California New or Little-Known West-American Willows

Dear Mr. Farquhar: Subject to the following notification, approval for publication was approved

Referring to your circular letter of November 20, 1933, and in accordance with the property of the University, and it was not be informing me that my paper entitled "New or Little-Known West-American Willows" had been approved for publication by the

editorial committee on November 10, I am writing to ask if you will be allowed for changes in proof (including

in the editorial committee on November 10, I am writing to ask if you will be allowed for changes in proof (including

can give me any idea as to when this is likely to reach the printed stage. It contains the descriptions of several new

species and varieties of which the type collections and other

material have long since been distributed to the leading

herbariums of the world. I am receiving inquiries as to where the original descriptions of these novelties are published.

I hope it won't be long now. Cordially yours,

Very truly yours,

Additional copies may be obtained by the author at cost of paper, printing, and postage. If he orders them before the paper is sent to press.

(3)

Carleton R. Ball

CRB:WC

Very truly yours,

S. T. Farquhar
Secretary, Editorial Committee

May 10, 1934

Professor Carleton R. Ball
Bureau of Public Administration
Campus

Dear Dr. Ball:

Your paper on "New or Little-Known West-American Willows" should go to the printer within the next few days. We have been swamped with manuscripts, and yours had to take its turn according to the serial number given it and has only recently arrived near the top of the pile. I am sorry for the delay but it is beyond my power to remedy the situation. I think the paper will be published within the next six weeks. I hope this will answer the questions raised in your letter of May 8.

Most sincerely yours,

Samuel T. Farquhar

Samuel T. Farquhar
Manager University Press

STF:SB

May 23, 1934

Mr. S. T. Farquhar
University Press
Campus

Dear Mr. Farquhar:

I am just in receipt of the edited manuscript entitled "New Or Little Known West American Willows" accepted for publication in the University Publications in Botany. I wish to thank the editorial staff for the care manifested in the editing, which has detected a few errors in punctuation which remained in the manuscript as submitted.

I have given attention to all the queries noted on the manuscript, and submit the following comments:

If the table of contents is to be printed, it requires the two changes which I have made thereon. One variety, *S. Scouleriana* var. *Thompsoni*, is deleted because that portion of the manuscript was withdrawn by permission and published elsewhere with other related material some time ago. Another variety, *S. Farrae* var. *microserrulata*, which is described on page 20 of the manuscript had been omitted from this table, and I have inserted it at the proper point.

No latin description accompanies the technical description of *S. Farrae* because it had been described previously. The ~~present~~ treatment is a redescription corrected and amplified with the aid of more copious material. The

The abstract on page 1-a has been corrected by the deletion of the withdrawn variety and the inclusion of the one omitted as noted above, and the ~~geographical~~ notes corrected accordingly.

The query on page 1-b regarding the placement of my professional title apparently is not for me to decide, but must be settled on university practice, with which I am not familiar. On page 9 I have indicated the proper placement of the detached clause which occurred at the end of the second paragraph.

On page 15 the phrase "Section Cordatae" is the beginning of a paragraph which is completed by the abbreviated description drawn up from the bottom of the page and inserted at the beginning in place of the latin description which would accompany the first naming of a species.

Trusting that these comments cover all the questions raised, I am

Cordially yours,

Carleton R. Ball

July 5, 1934

Mr. S. T. Farquhar
University Press
Campus

Dear Mr. Farquhar:

I am returning herewith the manuscript and corrected galley proof of my paper entitled "New Or Little Known West American Willows." I wish to compliment you and your staff on the excellent editing and typesetting which has been done on this job. So far as the editing is concerned, I found only three commas, if I remember correctly, which had been so inserted as to make their removal desirable in the interests of clearness. Against that, I find that I myself had left several minor errors and one or two omissions in the manuscript. The changes to correct or supply these have been indicated.

The rider inserted on galley 5 was a supplementary page prepared after the manuscript was finished and accidentally omitted from the ribbon copy. As it is a new and short paragraph, its insertion should not be difficult or expensive.

I note that the indication of the degree of reduction is omitted from the descriptions of the plates. It was intended that they should be natural size, but unfortunately I forgot to mark them, and they were actually engraved at $\frac{3}{4}$ natural size. Accordingly, I have put the designation "x $\frac{3}{4}$ " at the end of each plate description.

Cordially yours,

Carleton R. Ball.

CRB:WC

July 26, 1934

Mr. Samuel T. Farquhar
Superintendent of the Printing Office
Campus

Dear Mr. Farquhar:

I am returning herewith a first page proof of the paper entitled: "New or Little Known West American Willows". The few corrections needed have been indicated on the proofs. I am greatly pleased with the excellent work done, there being but a single change required by any misunderstanding of the text.

As I have noted on the proofs, the illustrations are relatively faintly printed. I take it, however, that this is merely a matter of inking, as the proofs submitted with the galleys were satisfactory.

I wish to obtain one hundred reprints of this paper. I have forgotten how many are furnished free by the University but wish to purchase enough in addition to those supplied gratis to make the total number one hundred. I shall appreciate your placing my order for the additional number.

Very sincerely yours,

CRB:LS
Enclosure

Carleton R. Ball

August 6, 1934

Professor Carleton R. Ball
117 Library
Campus

My dear Dr. Ball:

At a meeting of the Executive Committee of the Editorial Committee held on August 3 your request for additional copies of your paper, "New or Little Known West American Willows" was discussed, and 150 additional copies were granted to you as author provided you make use of them in a manner customary with the Department of Botany. It was suggested that you discuss the matter with Professor Goodspeed, and accept his advice on the distribution of these copies.

I might draw your attention to the rule that you are permitted to buy as many additional copies as you wish for personal use at the cost of paper, press-work, and binding. If after talking with Dr. Goodspeed you need still more than those granted by the Editorial Committee will you please communicate with me so that I may place your order.

Most sincerely yours,

Samuel T. Farquhar

Samuel T. Farquhar
Secretary, Editorial Committee

STF:AH

September 24, 1934

Mr. Samuel T. Farquhar, Manager
University Press
Campus

Dear Mr. Farquhar:

The arrival of the 50 copies of my paper entitled "New or Little Known American Willows," together with 150 copies granted to me by the Executive Committee of the Editorial Committee, brought forcefully to my attention the fact that I had never replied to your kind letter of August 6 on this subject. I have taken the matter up with Dr. Goodspeed, and he has given me the information which will prevent any possibility of duplication or other wasteful use of this valuable material, in connection with its distribution by me.

I note also the desire for material for the index, and take pleasure in attaching hereto a sheet showing the index which seemed desirable. If it is not the custom to index each newly created species and variety, then only the first and last index on the list would be used.

Thank you for your many courtesies.

Very sincerely yours,

Carleton R. Ball

CRB:WC
Encl.

June 22, 1933.

Dr. W. A. Setchell,
Department of Botany,
Life Sciences Building,
Campus.

Dear Dr. Setchell:

I am transmitting herewith a manuscript entitled: "New
or Little Known Western Willows" which contains descriptions of three
new species and four new varieties. In accordance with your request
I have attached an abstract of the paper suitable for use in Botanical
Abstracts or elsewhere. Trusting that this will be found suitable for
the University of California publications in Botany, I am

Cordially yours,

Carleton R. Ball