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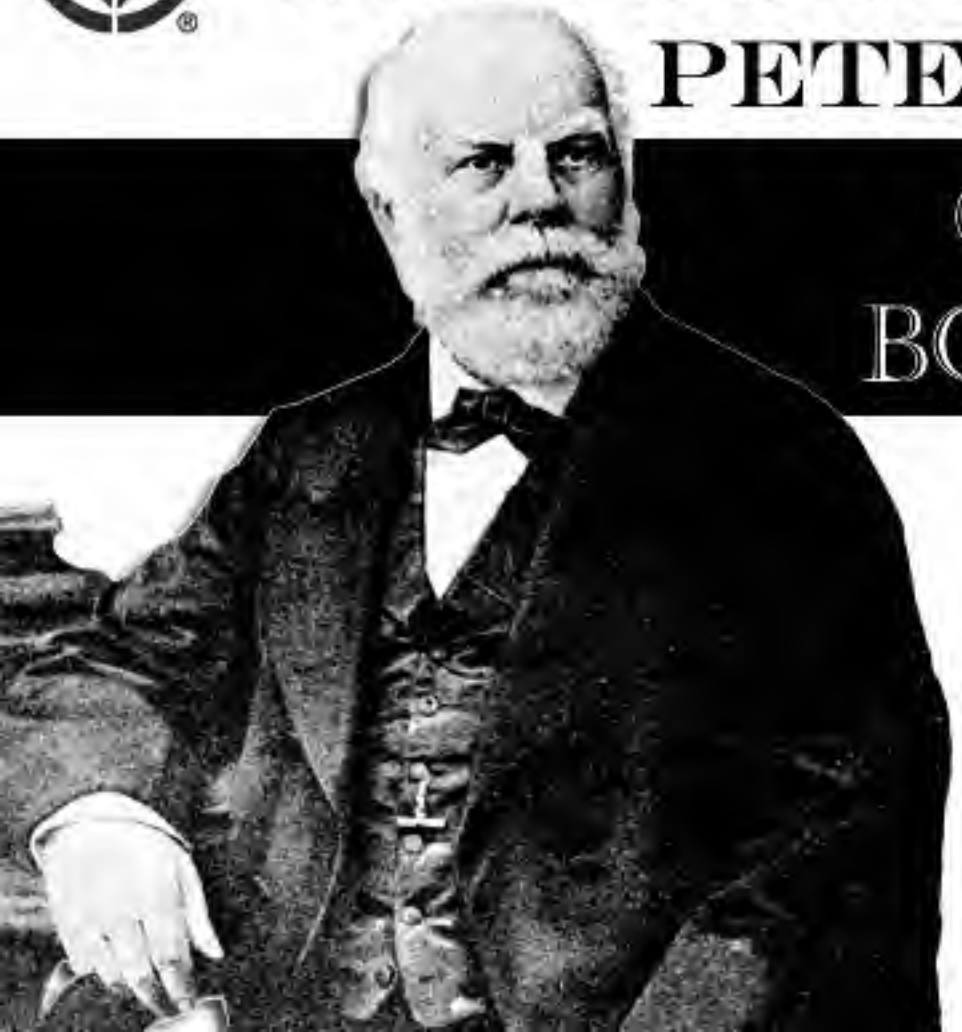

Pagination Note:
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Alisma Plantago fol.

calyx inferior
corolla valvat. praeflorationis involut.
stam. 6 c. sepalis et petalis altern.
ovaria in capitulum singula
sorbem dispositis

Echinodorus: fl. hermaphr.
calyx et corroll. inferior, praeflorat. involut.
stam. (6 ? vel pleura) sepalis petalisque opposita,
ovaria in capitulum disposita.

Sagittaria: fl. monoic. s. dioic.
nux polyaica
cetera ut in Echinodoro

Sag ? carpellis compressis disposit
dorso cristatis

Echin ? carpellis turgidis angulatis s.
plurics cristatis.
(dum obtusifolia, natans,
nymphaefolia

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Dr Darlington in his Flora published 1826 observes that *Sagittaria sagittifolia* (variabilis) bears *tubers*; Kalm has already stated the same as Darlington observes in a letter to Gray Sept 20. 1858. and says that they are sometimes as big as a man's fist; Darlington has seen them as big as a pullet's egg and smaller. They do not seem to occur in dry ground, but in miry, muddy places. — He says that they are the end of stolons.

Note, Octob 21st Sagitt. stolonifera S & Gr. (non O. grandiflora Mx) N. Lindh. II p. 26. was found on such specimens and I observe it also in several Sagittarias. Is it found in all *perennial* Sagittarias? And are some Sagittarias *annual*? I suspect that my *S. calycina* is an annual (or biennial?) plant — *S. natans* also??

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Aug. 1856

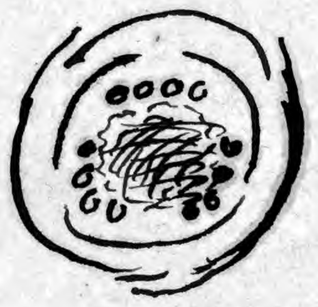
Sagittaria calycina

humilis, foliis late ovatis, obtusis, profunde hastatis, lobis late triangulatis (saepe acuminatis) valde divaricatis, scapo debili tenuiusculo, demum decumbente, verticillis paucis, 2–3 floris; bractei obovatae albae, membranaceae; pedicellis fertilibus sterilibusque ~~plus~~ aequilongis; pedicellis fertilibus plerumque singulis saepius binis; pedicellis fertilibus post inflorescentiam incrassatis (pollinaribus) recurvatis;

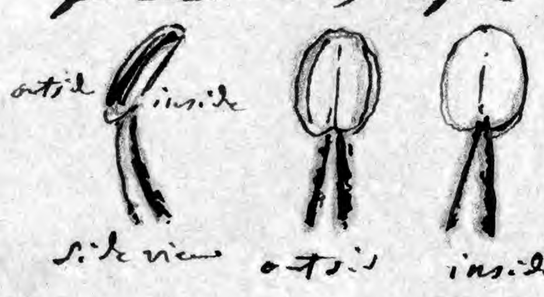
sepalis obovatis rarius ovatis (albastro inde triangularis)

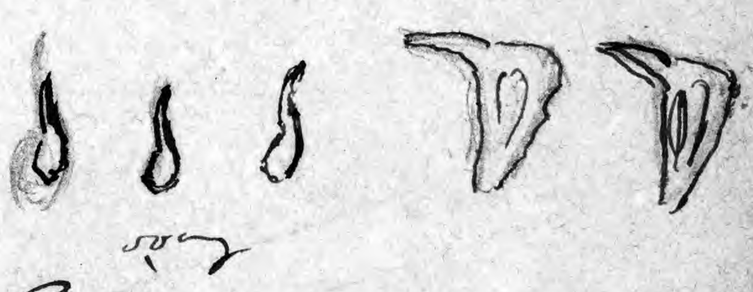
floribus foemineis ~~pl~~ sub 12 andreis

stamina 4 sepalo opposita



stamens of a fertile flower





filament as long as anther, subulate, ~~smooth~~ ~~papillose~~ slightly papillose

anthers subobtusiusculat., scarcely cordate at base;

stylis subulatis, ovario longioribus

filament of a sterile flower a little longer than anthers – post anthesin only!

sterile flowers also with a rudiment of ovary & stigmata, only not so many

over

filaments even in the sterile fl. few (not more than 24 about)

but ovaries extremely numerous in the fertile fruit elongate narrow, subulat horizontal

style half as long.

fruits calyx erect at

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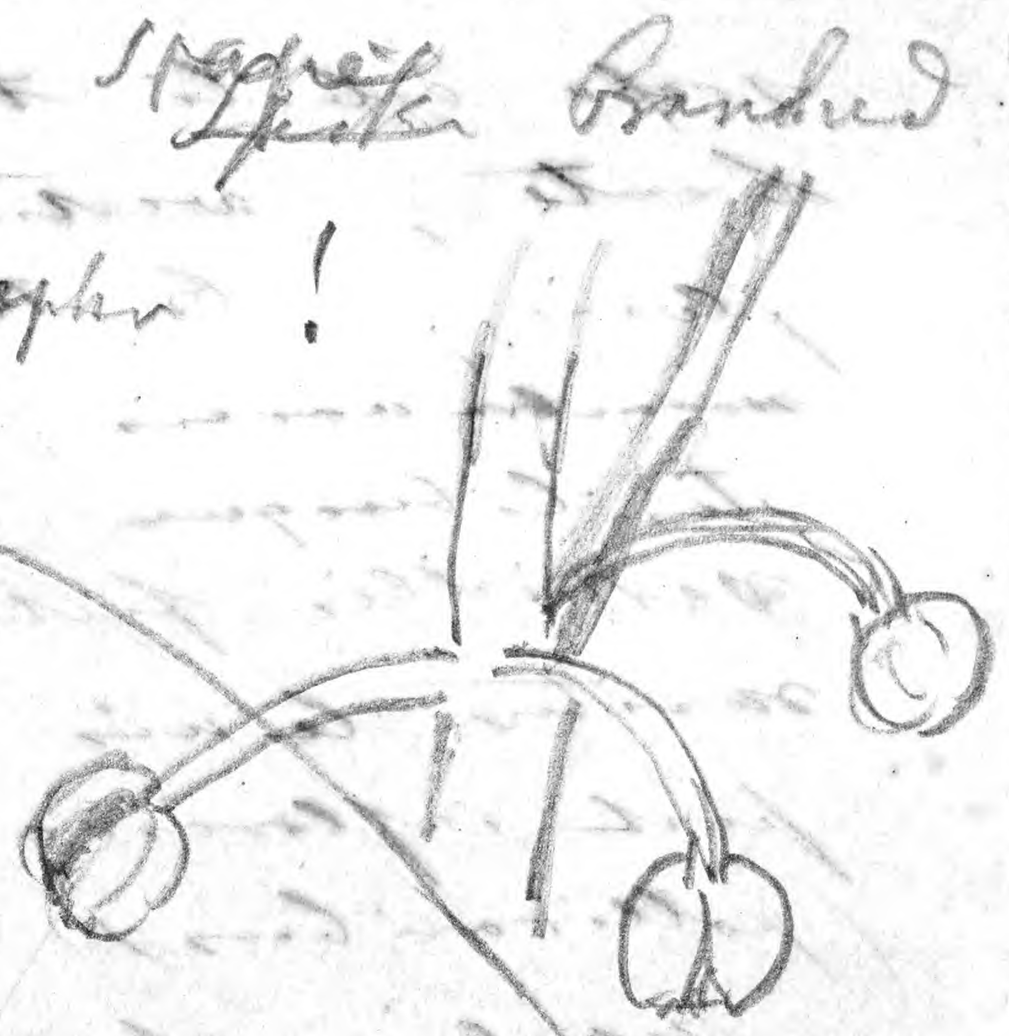
an immense form of this —
also HG Torrey
Herb Greg for 1/ Louisiana Hale
leaf as figured — Stigmas bunched
also hermaphr!



heads of lin distan.
petiolate 1 inch long.
fruits lanceolate acute!

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Sagittaria sagittata Thunb. Jäpan
Sagitt. sagittifolia Loureiro } Chinensis
Lims
Bot Mag 1814

S. chinensis Lou Chou

Ch Wright : AG Gray 1856

S. sagittif. Beechey Voy p. 220
has fem. pedunc. very short! (= S. sagittif?)
S. sagittif. Jacquem Kashmir, HC Hook
has ♂ & ♀ peduncles very slender, see notes
HC Hook

figure : Bot Mag

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Memoranda made in

Examining Herbaria

65-82

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Aplopappus Cass

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For Boundary Report [Held 57]
written for Prof Torrey
N York

Sagittaria calycina

pedicellis fertilibus sterilibus
acquantibus, demum recurvatis

floribus omnibus subhermaphro-
ditis; fl. fertilibus sub-
dodecandris, sterilibus
polyandris
ovario parvo stellatim pilosis;
filamentis subulatis latissimis s.
antheram late ovatam acquantibus
sed paulo longiori superantibus

stylo erecto ovario longiore,
in ~~achenio~~ in capitulo
~~maturo obovato~~ horizontali
in capitulis maturis obovatis
Pappo longioribus horizontali
~~sub~~ sepalis orbiculatis persistentibus
~~capsita~~ carpella involventibus
acute

α. maxima foliis
maximis sive latissimis
hastatis, laciniis divaricatissimis

var. depauperata

Maine & Delaware

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tenuiter subulata – appendiculis

parce setosis Jameson

bractis lanceolatis adstris

ovatis villis patentibus plerisque

capitulis magnis

Pale Louisiana

β. media. foliis minoribus

sive latissime lanceolatis, oblongis

dorsaliter s. diversifoliis,

~~saepe debili~~ arcuatis

saepe debili s. simplici

ovato-ellipticis infimis solum bractei ovati (rare oblongi,

duobus) fertili; capitulis

minoribus

Saline swamps Jefferson Co

Missouri.

δ. f. flexilis foliis ~~lineari~~

oblongo-linearibus flaccidis,

saepe debili ovato-ellipticis saepe

1–2 floris, bractea oblongo-lineari pedicellis elongatis

capitulis minoribus; inaequaliter

over

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In the Herbarium - Missouri

and Wright, 1899

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April 1856

Sagittaria

I filamentis subulatis

A. glabris

1. S. sagittifolia L filamentis antheram ovatam aequantibus stylis ovariis subaequantibus, capsulis obovatis obovatis, latissime alatis, apiculatis.

2. S. mexicana E ~~filamentis~~ antheris oblongo linearibus ~~longioribus~~, stylis subnullis ovario multo brevioribus capsulis obovatis obovatis, brevissime apiculatis.

3. α. vera, filamentis antheris longioribus pedicellis fructiferis mesculos aequantibus capsulis apice apiculatis

β? neomexicana filamentis antheris subbrevioribus, pedicellis fructiferis quam mesculi multo brevioribus, capsulis ventre apiculatis.

3. S. variabilis E. ~~antheris oblongo~~ filamentis antheris oblongo linearibus longioribus, stylis late subulatis falcatis ovario multo longioribus capsulis obovatis v. obovato oblongatis, conico v. ovato que rostratis.

4 S. fluitans E (hermaphrodite) filamentis antheris ovato multo longioribus, stylis petalis ovario aequantibus, capsulis obovatis rostratis.

S. natans ?

B. glandulosa-pubescentis

5. S. falcata Pursh filamentis antheram oblongo-linearem aequantibus (v. ea longioribus ?) stylis subulatis ovario aequantibus capsulis oblanceolatis falcatis stylo rostratis. (S. lancifolia Ell II. 591 !)

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II. filamentis basi bulbosis

A glabris

6. S. bulbosa Don ♃ filamentis antheram oblongo-linearem aequantibus stylis ovario multo brevioribus, capsulis obovatis obovatis, ~~rostro brevi ventrali~~ ventre brevi rostratis. (Texas)

7. S. pusilla Nutt. filamentis antheram ovatam aequantibus, stylis ovario aequantibus capsulis obovatis, stylo erecto paulo curvato brevius rostratis, 3 carinatis

8. S. longiloba E filamentis antheram ovatam aequantibus, stylis ovario multo brevioribus capsulis angusto obovatis, ~~obtusis~~ v.v. x brevissime apiculatis

B glandulosa — puberulis

~~9. S. simplex Pursh filamentis antheram ovatam aequantibus~~

9. S. simplex Pursh filamentis antheram ovatam aequantibus stylis ovario brevioribus capsulis angusto obovatis ventre (s. minus apiculatis brevissime apiculatis

α simplex vera stylo horizontali ovario multo breviore (Ohio)

β grandifolia stylo erecto falcato ovario subaequante capsulis falcato-rostratis (Mobley)

β. acutifolia stylo erecto ovario breviore

10. S. graminea Mich? Elliott? filamentis antheram oblongo-lanceolatam aequantibus stylis erectis ovario aequantibus; capsulis late obovatis rostratis. S. Carolina

sous 9. β. bleg here? an rejunfi seu

11. S. heterophylla Pursh fil. anth. ovat. aequantibus stylis filamentis ovario multo longioribus. capsulis angusto obovatis longe rostratis, rostro erecto recurvo

April 1856

Sagittaria variabilis Monoica s. Dioica, stolonifera foliis plerumque sagittatis, scapo robusto vel simplici s. ramoso bracteis plerumque acutis s. acuminatis vel villis plantis foemineis pedicellis foemineis masculis subduplo brevioribus, antheris lineari-oblongis, planiusculis subulato glabro brevioribus; stylis obliquatis falcatis ovaria duplo longioribus. capsulis late obovatis s. suborbicularibus; stylo triangulari horizontali s. subexserto plus minus uncinato rostratis.

A. Glabratae bracteis acutis s. acuminatis

A. Dioicae

1. obtusa scapo ramoso, foliis maximis obtusis, lobis vetis, latis, parallelis

2. acuta scapo simplici, foliis grandibus, acuminatis dimidiato sagittatis.

3. subdivisa B. scapo simplici subdivisa, foliis sagittatis acutis, lobis acuminatis, vetis s. divaricatis.

B. Monoicae

4 communis

5. hastata

6. angustifolia

7. gracilis

8 divaricata A. lobis foliis integris acutis s. lobo singulo binisve hastatis

9. Canaliculata S. Carolina, foliis binis canaliculatis rigidis,

II Pubescentes

10? pubescens Pennsylvania Dioica s. monoica bracteis obsoleto ovatis obtusis pubescentibus s. hispidis (fruit not seen but style identical with main form)

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1. sagittifolia, monoica, foliis sagittatis, lobis divaricatis (marginibus integris, subinde submucronatis, obtusis) verticillis infimis foeminis; pedicellis foeminis maxime multo (ter quaterve) brevioribus; petalis purpureo-unguiculatis; antheris ovatis late purpureis — connivantes; filamentis subulatis glabris sequentibus; stylo triangulari ovario subaequante; — capsulis obsolete obovatis latissime alatis; stylis brevis, rectis ~~contortis~~ apiculatis.

Fits and Anthers and red colour of unguis and connivance distinguish it from L. variabilis

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April 1856

Sagittaria acutifolia (Philadelphia & Bethlehem)
= stolonifera (Texas) Pl. Lindheim No. 183 foliis submersis acutis, emersis limbo lineari lanceolato praeditis; ~~ovario~~ stylo ovarium dimidium aequante, erecto — capsulis?

See description of S. simplex in another sheet; it differs only from it by the shape of the leaves and the acute erect longer style — fruit seems hardly different. — Same Chapman Florida = H6 Gr

Bulbosa Don is a new published in Edinburg 1798 — never described — suitable for Nuttallia

Sagittaria ~~bulbosa~~ Don? ~~foliis linearibus~~

radice bulbosa, foliis linearibus s. ovato lanceolatis erectis, floribus scapo simplici s. ramoso brevioribus; bractiis asperulis obtusis; sepalis pedicellis gracilibus femineis masculis paulo brevioribus, sepalis obsoletis asperulis, petalis basi bulbosis glabris, antheris oblongo-linearibus acquantibus; stylis ovarii multo brevioribus; capsulis obsoletis obovatis ventre horizontaliter rostratis

Lost Prairies near Houston, Texas Pl. Lindh 182. 1-1½ feet high; leaves 2-8 inches long 2-6 lines wide, rigid; bulb forming every year above the old one (Oxia is the reverse) — covered by fibrous remains of old leaves. —

Near S. falcata — distinguished by the bulbous and naked filaments and the almost obsolete fruit with a short beak, far below the point on the anterior edge — Smaller in every

In Herb. Gray is the same, — in imperfect, for Dr Hale, Louisiana, without bulbs, and another large form: scape 3 feet high, much branched; leaves ½ foot long 2-4 or 5 lines wide, petioles 1 foot long — some flower & fruit, anthers long sepals mucronate, bulb of plant smaller, smooth.

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Elliott! II. 592

Sagittaria gramineus Mich? folis linearibus s. lineari-lanceolatis, floribus nullo s. semim pentaspermo dilatato; scapo folius longiore, simplice, bracteis laevibus, triangulatis acutiusculis; pedicellis foem masculis paulo brevioribus; ~~floribus~~ sepalis laevibus, filamentis basi bulbosis pubescentibus; ovarii stylo aequilongo mutico; ~~mutico~~; capsulis ~~late~~ obovatis, brevius v. vix rostratis.

Shallow water & margin of ponds

S. Carolina S. A. Curtiss (A & C)

from 6–12 inches high —, leaves with petioles 2–10 inches long; 1–3 l wide; not rigid like S. gramineus — Evidently allied to S. simplex var acutifolia — and perhaps the same. Seems however distinguished by the shorter female pedicells, larger fem flowers and fruit heads, and larger fruit, which is distinctly pointed or rostrate. —

Probably too near acutifolia

April 1856

Is simplex varies? yes!

S. laurifolia in my Herb. fr. Curtis foliis ovatis magnis, ~~[illegible]~~ obtusiusculis, digitato nervosis, & transversim parallelo venosis; ~~[illegible]~~ simplicis Carolinis triangulares, acutis basi connatis; pedicellis fere & maxime aequalibus elongatis; filamentis basi bulbosis pubescentibus, antheris ovatis aequilibus; ovariis falcatis, stylo nervo aequilongo rostratis; capsulis obovatis rostratis.

~~Georgia~~ Curtis ~~New~~ New Orleans Lender. 1–2 feet high, leaves 3–6 inches long, 1–2½ wide; looks like a large & overgrown S. simplex, ~~flowers~~ also the same, but ovaries, styles, & capsules very different – no ripe capsules seen – pedicells 1–2 inches long.

The Georgia plant is smaller is is hardly different from the ordinary St Louis form of S. simplex; style shorter than ~~fruit~~ ovary; somewhat like the form of acutifolia. – The description above refers to style of the New Orleans plant.

Leaves in both with the venation of the St Louis plant

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Sagittaria pusilla Nutt foliis subulatis s. canaliculatis angusteque linearibus – lanceolatis, pedicellis scapum brevem superantibus, (1–2 verticillatis) paucioribus; flore s. singulo femineo, demum decumbente, pedicello aequilongo v. brevioribus; fructibus ovatis; sepalis ovatis obtusis; filamentis basi bulbosis; antheris ovatis aequantibus; capitulis stylo erecto curvato ovarium aequante; achaeniis anguste obovatis, stylo rostratis, dorso 3 carinatis, nec alatis. —

Specimens from N Carolina & Pennsylv. are identical. — First indicates an approximation to Echinodorus!

Sagittaria heterophylla var rigida, Nuttall

plantis antheriferis longioribus; foliis emersis elongatis rigidis utrinque longe attenuatis, linearibus – lanceolatis 5–nerviis, —

S. heterophylla. stylo erecto subulato ad recurvato, ovario longe aequante,

foliis nervosis, parallelle venosis

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1. Sagittaria sagittifolia, Linn. fl. monoicis ~~[illegible]~~ s. aut. bract. obtusiusculis; verticillo infimo femineo, pedicellis femineis masculis multo brevioribus; petalis purpureo-unguiculatis; commissura antherarum lata purpurascente?

2. Sagittaria sagittifolia stolonifera Americana, specie distincta: floribus monoicis s. dioicis; scapo simplici s. ramoso; subcompresso, striato sulcato (12 angul) verticillo infimo solitario, vel pluribus femineis; bracteis acuminatis; pedicellis femineis masculis dimidio gracilibus brevioribus; petalis albis (luteis) unguiculatis, commissura antherarum angustiore filamentis subtetis, anthera duplo longioribus

3. S. heterophylla stolonifera petiolis nodosis, Pursh floribus monoicis; scapo simplici, debili demum procumbente; verticillo infimo femineo (subinde subcaespitoso), bracteis obtusis, suborbiculatis; pedicellis femineis brevissimis masculis elongatis.

4. S. simplex stolonifera petiolis vix nodosis, Pursh Mattey house & other ponds — floribus monoicis, scapo (gracilius) simplici, erecto; verticillo infimo obtuse triangulato subteretis plerumque s. pluribus foemineis, bracteis obtusis triangularibus, infimis acutiusculis ~~subinde~~ in cupulam connatis; pedicellis gracilibus superioribus foemineis masculos aequantibus elongatis. — filamentis e basi callosa conica subulata glandulosa brevissime subulatis. antheram aequantibus perigonii foliis exterioribus herbaceis margine petaloideis stylo brevissimo; capitulo horizontali obtuso, brevissime gibboso (stylo ventrali)

2. S. variabilis (sagittifolia americana) is sometimes 5' high much branched fruit heads 10 lines in diameter — scape below 15–18 lines in diameter, always 12-angled — 3 angles more prominent — filaments longer than anthers, but not always twice as long (swamps of American bottom Sept 47)

3. S. heterophylla (Swamps at head of Cheonteau Pond Octob 47) in water — very large specimens) scape with milky juice acutely triangular above female verticil subterete below, decumbent petiole on the large overgrown plants with 3 wings and two intermediate angles — Stamens exactly as in S. simplex.

3. S. heterophylla ovalifolia (margin of swamp back of Capt Bissels — on the hills.) scape decumbent nearly terete, acutely triangular above the ascendent lowest (female) verticill; ~~section of~~ petiole mostly

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sharply 3angled, rarely somewhat three winged with or without intermediate angles, but

these are never as prominent as in the plants from Charleston pond.

~~Sagittaria sagittifolia pedicellis fl. fem. ipsi fl. mas. ter quaterna brevioribus, robustior.~~

S. pusilla Mich.

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April 1856

= S. macrophylla Juss ?

monoica

Sagittaria mexicana n. sp. foliis sagittatis, lanceolatis, lobis foliis ipsis longioribus; scapo erecto gracili, bractei lanceolatis acuminatis; pedicellis gracilibus elongatis (masculis foemineis) aequilongis; antheris filamentis ebasi incrassata subulatis, antheris longioribus; nucc late obovato, alato, stylo brevissimo apiculato.

Zamora, western Mexico, in ditches, May collected by Dr Gregg 1849. — Plant 1–2 feet high; with large white flowers; leaves sometimes 6 inches long with lobes of 7–8 inches in length. Scapes several on my specimen, flowering almost from the base, pedicells 1½–2 inches long; about the length of the internodes.

In some respects allied to our S. simplex, but leaves very different, fruit & stamens. The resemblance consists in the elongated female pedicells and the short apiculate or almost blunt fruit. — form of last ?

monoica

Sagittaria neomexicana foliis lanceolatis s. triangulatis, sagittatis; lobis divergentibus apicibus convergentibus; scapo simplici s. ramoso, bracteis lanceolatis acuminatis, verticillis singulis s. pluribus foemineis, pedicellis foemineis brevioribus quam masculis; filamentis subulatis antheris brevioribus, nucibus obovato-orbiculatis brevissime apiculatis.

Santa Fe and below Albuquerque, Fendler. — Intermediate between variabilis & mexicana, approaching the latter in the form of style & fruit and the former in the shorter petioles, and more compact inflorescence. Also Santa Fe Dr Edwards — and San Elizario, Bigelow. This last one has lobes of leaf much longer than lamina, somewhat divaricate.

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Longest styles and therefore most bristly head of carpels has

S. heterophylla, next comes } bristly
S. vaniabilis, then } (echinate

S. falcata } ~~short~~ pointed
S. sagittifolia } carpels
S. neomexicana } (tuberculate)
S. mexicana } blunt (on
S. simplex } account of short
} (~~[illegible]~~ erigata) style
lacerissula

Sagittaria fluvitans submersa, limbo folium fluvitante, linear oblongo acuto scapo gracilis parviflora, bracteis orbiculatis, obtusis pedunculis superioribus elongatis floribus hermaphroditis 8–12 andris, ~~elyeibus~~ sepalis orbiculatis, filamentis subulatis, laevibus, antheris ovatis subduplo longioribus; stylo ovarii aequante, nunc vix ratus.

In the Mississippi near St Louis and in Western Texas (Wright No 1899.

Leaves 1–1½ inches long 1–3 l. wide linear with very narrow base or narrowly lanceolate with broad, obtuse or rounded tips

Scape as long as leaves (in my specimens 1–1½ feet high) rising to the surface of the water, lower peduncles much elongated, 2–3 inches long. All flowers examined are hermaphrodite — apetals ½ inch diameter. No ripe fruit seen.

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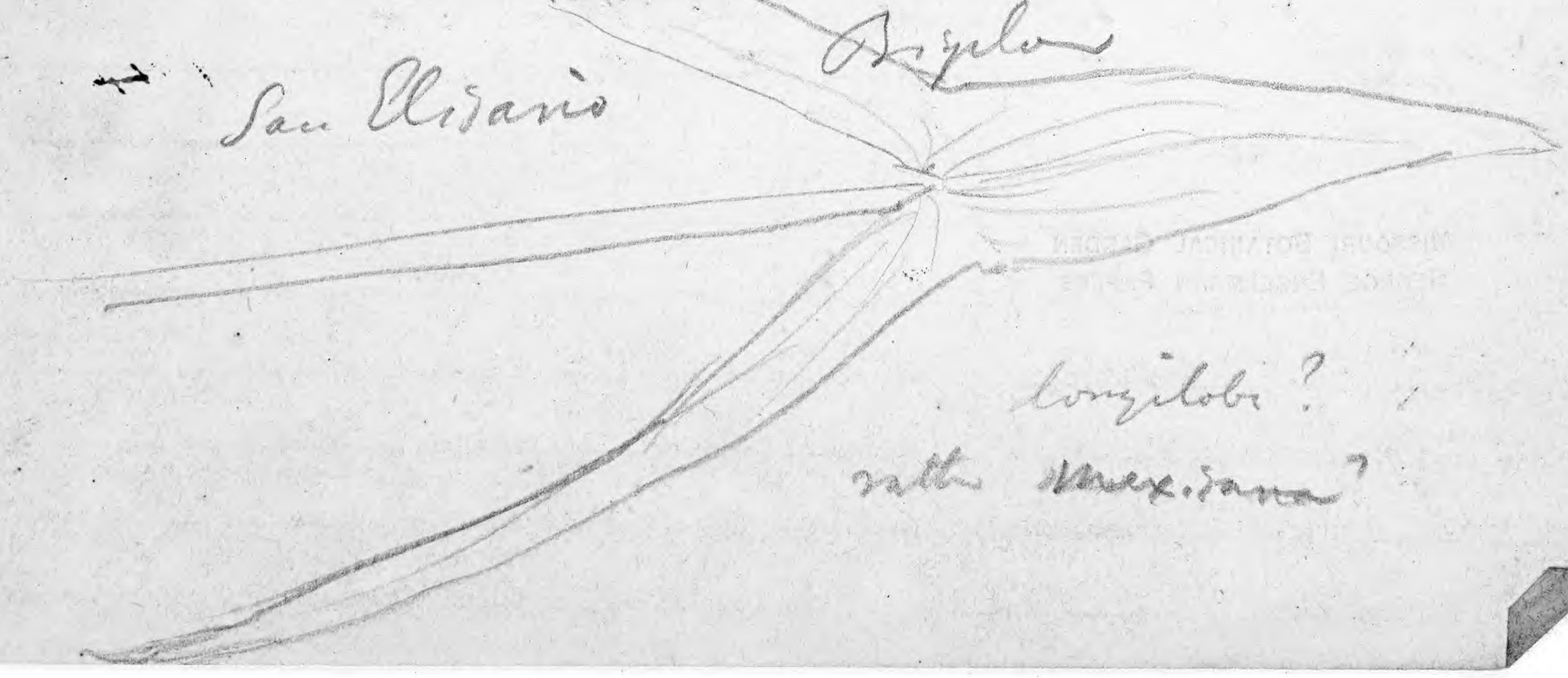
April 1856

Sagittaria Fendleri No. 840 Southwest of the Crossing of Arkansas River in shallow water on prairies

S. simplex var? longiloba plant ~~sagittati~~ ~~[illegible]~~ lobis linearibus – lanceolatis divaricatis, limbo triangulato multo longioribus; scapo ramoso, ramis infra vel fl. fem. nudis, supra fl. masculos gerentibus; bracteis ovatis acutis; pedicellis gracilibus fl. fem & mas. aequantibus; ~~a~~filamentis basi bulbosis glabris antheras ovatas aequantibus; stylis ~~[illegible]~~ ovario multo brevioribus; capsulis obovatis ~~brevibus~~ obtusis, plerumque breviter apiculatis

Similar to S. simplex in the long pedicells and the obovate obtuse fruit; distinct by the minutely sagittate leaves (I have seen but a single one!) the ramose scape, the larger heads of capsules (4 l. in diameter) the acute bracts, glabrous naked filaments and fruit which has the remnants of the short style on the apex, not on the ventral edge —

Leaf proper, inch long, lobes 2½ inches long; pedicells ½ inch long, flowers small



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Sagittaria falcata Pursh folius grandis, foliis lanceolatis (linearibus — ovatis) rigidis; floribus scapo simplici s. ramoso; bracteis ovatis acutis (pubescentis) pedicellis gracilis masculis dimidio brevioribus, sepalis obovatis nervosis plus minus pubescentis, filamentis subulatis pubescentis antheris oblongo linearibus acquantibus s. superantibus; stylo recto ovario acquante; capillo oblaniculato, fructo ~~acuminato~~ ~~mucronato~~ rostrato.

α. gigantea (S. gigantea Walter) Lake Pontchartrain — Salt in lakes near New Orleans also Florida folius coriaceis ovatis grandibus; stipitibus plerique teretis, scapo ramoso bracteis acuminatis; floribus gracilis subsed hermaphroditis

β. angustifolia (British Temps Pilcorston) folius linearilanceolatis stipitibus monoiris, bracteis obtusis, scapo simplici

γ. linearis Pinkey Fla

leaves 2 inches long 1–1½ lines wide — scape 1½–2 feet high — bracts acute

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