A FASCICULUS

OF 35 DRIED SPECIMENS OF

GRASSES,

AND A SMALL PACKET OF THE SEEDS OF EACH KIND.

Price 15*s.*

A

FASCICULUS

OF

THIRTY-FIVE DRIED SPECIMENS

OF

GRASSES,

AND

A SMALL PACKET OF THE SEEDS OF EACH KIND:

WITH

GENERIC AND SPECIFIC DESCRIPTIONS

AND

PRACTICAL REMARKS.

BY JOHN THORNHILL,

OF GATESHEAD, IN THE COUNTY OF DURHAM.

Gateshead:

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PREFACE.

HAVING, for many years, ſpent my leiſure hours in examining the different Plants which grow within the Counties of Durham and Northumberland, I was induced to attend more particularly to the GRASSES, from obſerving that Ray-graſs only was choſen, from among many other kinds, for general uſe.

A complaint from the farmer, that moſt of the ſeeds of the Ray-graſs, commonly ſown, produce only annual plants, proves that it is very defective, when the land on which it is ſown is intended to remain in graſs more than one year.

From the careful obſervations of ten years, I have found that cattle chuſe to feed on the Graſſes, rather than on any other herbage; that Ray-graſs is grateful to them; but that they do not prefer it to every other kind: beſides, Ray-graſs is inferior to many of the others, both in time of duration and weight of produce.

A Table, given at the end of this work, which was taken from a ſmall but careful experiment, ſhews that Ray-graſs is excelled, in weight of produce, by Sweet-ſcented Spring-graſs as eight, Common Cat's-tail-graſs as ſixteen, Meadow Fox-tail-graſs as eight, Mountain Hair-graſs as four, Flote Meadow-graſs as five, Rough Meadow-graſs as nine, Smooth-ſtalked Meadow-graſs as eleven, Rough Cock's-foot-graſs as thirty-nine, Creſted Dog's-tail-graſs as three, Hard Feſcue-graſs as eleven, Meadow Feſcue-graſs as thirty-two, and Yellow Oat-graſs as two, to one.

The Graſſes above-enumerated, and compared with Ray-graſs, all excel it in weight of produce, and are more permanent than it is; yet I would not recommend, for cultivation, Common Cat's-tail-graſs, becauſe of the ſtrength and harſhneſs of its lateral ſhoots; nor Mountain Hair-graſs, although ſheep like it, on account of the extreme ſmallneſs of its leaves. I would alſo reject Yellow Oat-graſs, becauſe its leaves are flaccid and downy: Meadow Fox-tail-graſs, and Rough Meadow-graſs, in rich moiſt ſoils yield an abundant crop, but are impatient of drought.

In the following work I have endeavoured to point out thoſe which I think the beſt of the Graſſes, that they may be ſelected for uſe; and the worſt, that they may be deſtroyed. Several that I have given ſpecimens and deſcriptions of, although cattle do not refuſe them, are not worth cultivation; therefore, to prevent their intruding upon, or occupying the places of better, they ſhould be deſtroyed.

I would recommend, for Meadow, Sweet-ſcented Spring-graſs, Meadow Fox-tail-graſs, Rough Meadow-graſs, Rough Cock's-foot-graſs, and Meadow Feſcue-graſs. For Paſture, Smooth-ſtalked Meadow-graſs, Hard Feſcue-graſs, and Blue Moor-graſs. For Meadow, or Paſture, Flote Meadow-graſs, Creſted Dog's-tail-graſs, Ray-graſs, and Downy Oat-graſs. The laſt almoſt loſes its character of downy by cultivation, and yields an abundant produce: on poor clayey ſoils it is very downy and weak; but on rich calcareous ſoils, even in its wild ſtate, it promiſes well, being luxuriant and nearly ſmooth.

I have arranged the Graſſes in my work according to the Linnæan Syſtem, after Doctor Smith's Flora Britannica; from which my generic deſcriptions are moſtly taken. I acknowledge the liberality of it's Author, who very generouſly allowed me to make uſe of his work. My ſpecific deſcriptions are from the Plants themſelves.

In all caſes where it could conveniently be done, a dried ſpecimen of the whole plant is given; of the very large ones, only the moſt conſpicuous parts.

The Packets of Seeds are ſmall, but ſufficient to make them known, which is all that is intended by giving them.

The Roman numerals diſtinguiſh the different Genera; the Species are numbered from 1 to 35, to correſpond with, and refer to, the dried Specimens and Packets of Seeds, which are numbered in the ſame manner.

The technical terms uſed in the deſcriptions, are moſt of them, I think, ſo far explained in the courſe of the work, as to be eaſily underſtood by thoſe who are not converſant in botanical language; perhaps *Stipula* may be an exception. It is a membranous ſtrap at the baſe of each leaf, on the ſtraw, and is placed between the leaf and ſtraw. The difference between Spike and Panicle, may be ſeen by inſpecting the dried Specimens.

To ſelect ten or a dozen Graſſes will certainly require both labour and attention, but is by no means an impoſſible taſk: their ſeeds being to gather by hand, ſeems, I confeſs, apparently very difficult, but the difficulty will almoſt diſappear, when it is conſidered, that if proper care be taken, moſt, if not all, ſuch ſeeds will be fertile, and that the produce of each ſeed will probably cover nine inches of ground. A pint of any kind of Graſs ſeeds may ſoon be gathered, and, of the ſmaller kinds, will hold two hundred and forty thouſand; from whence, to me, it is very evident, that the good Graſſes may be ſelected far more eaſily than might be ſuppoſed on a ſlight view.

The Right Reverend the Lord Biſhop of Landaff condeſcended to inform me, by Mr. William Falla, of Gateſhead, that he would recommend, for the purpoſe of raiſing ſelect Graſſes, for ſeed, land newly broken up, as being likely to be moſt free from weeds. I thank his Lordſhip for his remark; and beg leave to adviſe, in addition to it, that after the ground is made as clean as poſſible, the ſeeds be ſown in lines, with room between each line for a perſon to paſs, to take out weeds, and to thin the crop, ſo that one plant may not intrude upon another: I would alſo recommend, that ſpace be left to receive thoſe plants which are taken out of the lines, by which means the crop may be very much enlarged.

To the Subſcribers to my work I am very much obliged; and becauſe I have not been able to collect more than a hundred Specimens of each Graſs in one year, I intend to keep the Subſcription open two years more, if I meet with ſufficient encouragement.

GATESHEAD, *December*, 1806. JOHN THORNHILL.

ERRATUM.

P. 16. l. 24. *For* "and ſometimes very ſhort," *read*, "awn ſometimes," &c.

FASCICULUS OF GRASSES.

DIANDRIA—DIGYNIA.

I.

ANTHOXANTHUM. Calyx a two-valved glume or huſk, containing one flower. Corolla, a glume with two awned valves, containing one ſeed.

1. ANTHOXANTHUM ODORATUM. *Sweet-ſcented Spring Graſs.* Root compoſed of downy fibres.—Straw a foot high, ſingle, ſmall, grooved, jointed, naked above. Root leaves from two to ten inches long, flat, ſharp-pointed, pale green; thoſe of the ſtraw from one to three inches in length, ſpreading. Sheath long, a little inflated, grooved, briſtly at the opening. Stipula lance-ſhaped, jagged, erect, white. Spike ſingle, erect, acute, many flowered. Pedicles which ſupport the flowers ſwollen, and very hairy at their ſummits. Calyx, ſheathing, ſharp pointed, ſometimes a little ragged on the edges of the valves; keel green, rough, inner valve twice the length of the outer, with three nerves. Glume or huſk of the corolla of two nearly equal ruſt-coloured, awned valves, ſhorter than the calyx. Awns unequal, growing on the back of each valve, near the baſe; the longer awn twiſted, the ſhort one ſtraight. Nectary half the length of the corolla; two-leaved, ſmooth, acute. Anthers ſtrap-ſhaped. Styles white, projecting. Stigmas thread-ſhaped, hairy.——Perennial, flowers in May. Seed, a ſmall brown oval-ſhaped, grain, falling eaſily out of the huſk when ripe; and ripening early, is moſtly ſhed on the ſoil which produced it.

The fragrance of this Graſs, when dry, (it has very little odour when green) is its greateſt recommendation; for in paſtures, where it is crowded, it yields to its ſtronger neighbours, producing flowering ſtems, with very few laterals; and of courſe is not of much uſe to cattle; for they do not from choice eat the flowers of Graſſes, when growing, though neceſſity may compel them to eat the flowering ſtems of any Graſs. When this Graſs is not too much crowded, its produce is large. Whether its fragrance, when dry, may induce cattle to feed on the hay it is among, rather than on that where it does not make a part, I have not experienced: it is certainly, as to ſmell, the ſweeteſt of the Graſſes; but, to me, the ſmell of ſome of the others is more grateful, particularly the *Feſtucæ*.

II.

PHLEUM. Calyx, a two-valved glume or huſk; valves truncated, pointed, ſitting cloſe on the rachis, or receptacle; one-flowered, including the corolla.

2. PHLEUM PRATENSE. *Common Cat's-tail Graſs.* Root compoſed of ſtrong downy fibres. Straw erect, jointed, three to four feet high, ſtriated, leafy on the lower part, naked above. Leaves rather rough, thoſe from the root four to twelve inches long, thoſe of the ſtraw from two to ſix inches in length. Sheath cylindrical, long and ſtriated; ſtipula very ſhort, blunt and membranous. Spike erect, cylindrical, blunt; flowers numerous and crowded, (the ſpike is ſometimes ſeven inches long.) Keels of the calyx green and hairy, each terminated with a ſhort awn; interior margins membranous and white. Corolla, a glume or huſk, of two nearly equal thin white three-nerved valves. Anthers moſtly purple. Styles white. Seed a ſmall white grain, to which the corolla cloſely adheres.——Perennial, flowering from June to October.

This is rather a coarſe Graſs; it flouriſhes in the latter ſeaſon of the year, conſequently yields food for cattle when the finer Graſſes are not to be had; which renders it valuable to thoſe who have cattle late in the fields.

III.

ALOPECURUS. Calyx, a glume or huſk of two valves, one-flowered. Corolla, a glume or huſk of one valve.

3. ALOPECURUS PRATENSIS. *Meadow Fox-tail Graſs.* Root compoſed of numerous ſmall downy fibres. Straw erect, two, ſometimes three or more feet high, leafy on the lower part, naked and ſmooth above. Leaves nearly ſmooth, glaucous, thoſe from the root ſix to eighteen inches long, thoſe of the ſtraw from three to ſeven inches in length. Sheath long, a little inflated, ſtipula ſhort, downy. Spike nearly ſimple, erect, two to four inches long, ſoft, many-flowered. Calyx, valves nearly equal, lanceolate, compreſſed, white, marked with two green longitudinal lines, keeled, and hairy on the keel. Corolla a glume or huſk of one valve, ſmooth, except a few hairs on the keel near its ſummit, and a twiſted awn at its baſe, double the length of the flower. Seed, a ſmall flatted oval grain, to which both corolla and calyx cloſely adhere.——Perennial, flowers from May to July.

This is an excellent Meadow Graſs, yielding much weight of crop on rich moiſt ſoils, and ſhoots freely after it has been cut; its after-math is greedily eaten, by both horſes and cows. As a paſture Graſs, it is not ſo valuable, the finer Graſſes being preferred: it is left until it becomes too old and tough to be eaten, except cattle are compelled to it by hunger.

4. ALOPECURUS GENICULATUS. *Jointed Fox-tail Graſs.* Root compoſed of long unbranched fibres. Straw long, with many joints, lower part leaning and taking root at the joints; upper part aſcending, leafy, branched, and ſmooth. Leaves nearly ſmooth, of various lengths, according to the richneſs or poverty of the ſoil on which it grows. Sheaths ſhort, inflated, ſtriated, and ſmooth. Stipula ſhort, blunt, white, and ſlender. Spike cylindrical, ſhort, blunt, many flowered, pale purple, or white. Calyx, a huſk of two truncated awnleſs valves, white, with two green lines, and a green hairy keel. Corolla, a huſk of one valve, crenated at its top, with a twiſted awn near its baſe, a little longer than the flower. Anthers, purple or white. Styles white. Seed a little plump oval grain, to which both corolla and calyx adhere.——Perennial, flowers from June to September.

Common in moiſt ſoils: ſhould be deſtroyed, to give place to better Graſſes.

IV.

AGROSTIS. Calyx, a huſk of two nearly equal acute valves, containing one flower. Corolla, a huſk of two unequal, membranous, acute valves; one of them the length of the calyx, the other half as long.

5. AGROSTIS VULGARIS. *Fine Bent Graſs.* Root fibrous, downy, creeping a little. Straw erect, from four inches to two feet high, leafy on the lower part, naked above. Leaves narrow, acute, a little rough to the touch; varying much in length, from ſoil and ſituation.—Sheaths long. Stipula very ſhort, blunt, and ragged. Panicle erect, purple, in alternate half-whirls; branched, ſpreading; branches ſmall, zig-zag, often terminating in three-forked diviſions. Calyx valves nearly equal, lance-ſhaped, acute, ſpreading, purple at the baſe, white above and on the margin, which is often ragged. Valves of the corolla white and thin; outer valve nearly as long as the calyx, acute; inner valve half the length of the outer, blunt. Anthers yellowiſh brown. Styles white. Seed a very ſmall oval grain.——Perennial, flowers from July to Auguſt.

This Graſs is common in moſt ſoils and ſituations; and is large or ſmall, according to the richneſs or poverty of the ſoil on which it grows. Being a late Graſs, it ſhoots freely in the autumnal months, but does not ſeem to be very much liked, either by cows or horſes, therefore ſhould be eradicated.

6. AGROSTIS STOLONIFERA. *Creeping Bent Graſs. Black Couch Graſs.* Root fibrous, downy, and very much branched. Straw leaning, branched, ſmooth, with many joints, and leafy to very near its top; joints contracted, dark-purple, lower ones yielding both roots and ſhoots. Leaves ſhort, broad, nerved, and rough. Sheaths, lower ones ſhort, the uppermoſt long.—Stipula, long and ragged. Panicle erect, branches in almoſt complete whirls; lower ones ſpreading, the upper ones cloſe preſſed to the receptacle. Calyx valves equal, blunt, pale purple, a little downy, keeled, and rough on the keel. Corolla ſhorter than the calyx; valves unequal, blunt; the outer valve has ſometimes the rudiment of an awn on its back. Anthers pale purple, ſtyles white. Seed, a very ſmall oval-ſhaped grain.

This Graſs is very injurious to the Agriculturiſt; when it once gets into cultivated ground it is hardly poſſible to eradicate it, its ſhoots running in every direction, and producing roots at every joint, the ſpace between each joint being only two inches. I would adviſe the Farmer to examine the borders of his corn-fields; and, where he finds this Graſs, to prevent its increaſe, at leaſt from ſeed, by cauſing it to be cut down while in flower. A little labour ſpent in that way would often ſave a great deal.

V.

AIRA. Calyx, a huſk of two valves, ſometimes having three, but moſtly only two flowers, with the rudiment of a third. Corolla, a huſk of two valves.

7. AIRA AQUATICA. *Water-Hair Graſs.* Root compoſed of very long white fibres. Straw floating, very long, branched, much jointed, and leafy, often to the baſe of the panicle: all the joints produce roots, except the uppermoſt. Leaves ſhort, flat, and ſmooth. Sheaths ſhort, inflated. Stipula ſhort, pointed, very white, and entire. Panicle erect, branches in half-whirls, ſpreading, unequal, ſmooth, many-flowered. Calyx valves unequal, blunt, the larger valve three-nerved at its baſe; the leſſer, with only one nerve. Corolla, a huſk of two nearly equal, blunt valves, much larger than the calyx; outer valve three-nerved, the inner has only two nerves. Seed, a ſmall oval grain.——Perennial, flowers from June to Auguſt. Grows in both ſtanding and running waters.

This Grafs is agreeable to both cows and horfes, the former feem very fond of it. I much fear that it would not grow out of water. Where meadows are fubject to be overflowed, it would be well to fow its feeds, which it yields in profufion; if fuccefs attended the trial, the labour would be well beftowed, and richly repaid; for excellent food for cattle would be got on places where moftly plants of little value are produced. Such a trial might eafily be made on a fmall fcale.

8. AIRA CÆSPITOSA. *Turfy Hair Grafs.* Root fibrous, ftrong; grows crowded in bundles. Straw three feet high, erect, with two joints and two leaves. Root leaves very long, narrow, and rigid; thofe on the ftraw fhort and narrow, alfo very harfh and ftrong; thofe of both root and ftraw rough on the upper furface and fmooth beneath: radical ones fheathing and dilated at the bafe. Sheaths of the ftraw, cylindrical, fmooth; lower one fhort, upper one long. Stipula, long, acute, fplit in two. Panicle fometimes a foot long, fpreading; in expofed places brown and fhining, in fhady places white: principal branches in alternate half-whirls; fecondary branches crowded, many-flowered. Calyx valves nearly equal in length, one rather broader than the other, both lance-fhaped, keeled, and rough on the keel. Flowers one above the other. Valves of the corolla fmooth, outer one broader than the inner, ragged at its top, with an awn fixed near its bafe; awn feldom longer than the valve. Seed, a very fmall oval grain.——Perennial, flowering in June and July.

Common, but moft plentiful in moift grounds: a bad, harfh Grafs, yet neceffity fometimes compels cattle to eat it. The Farmer who allows it to continue in his ground is much to blame; for, if it was not allowed to ripen its feeds, (which it yields in profufion) it might very eafily be deftroyed; its roots not creeping, and growing in tufts, it is not difficult to dig it up.

9. AIRA FLEXUOSA. *Zig-zag Mountain Hair Grafs.* Root compofed of ftrong, fometimes downy, fibres; very little branched. Straw, one to two feet high, with one joint at the bafe, and another a little above; naked on the upper part, and very fmooth. Root leaves in bundles, commonly four iffuing from a fhort brown membranous fheath, briftle-fhaped, fmall, feldom exceeding two inches in length. Sheaths on the ftraw two, (each terminated by a fhort flender leaf,) cylindrical, ftriated, fmooth; lower fheath an inch and a half long, upper one three inches. Stipula rather long, blunt, divided in the middle. Panicle branches, generally three-forked, few-flowered, fpreading, foot ftalks zig-zag and rough. Flowers erect, pale purple, with a filvery glofs. Calyx valves nearly equal, lance-fhaped, keeled, fmooth, often ragged at their points. Corolla, valves unequal, bafes hairy, outer convex, with an awn near its bafe; inner one rather concave, membranous, without an awn.—Seed, a fmall oval grain.——Perennial, flowers from June to Auguft.

Common in high paftures. A tolerably good Grafs for fheep; but hardly deferves cultivation.

10. AIRA CARYOPHYLLEA. *Silver Hair Grafs.* Root fibrous, very fmall. Straw often branched near its bafe, fmall; joints commonly three. Root leaves fmall, foon perifhing; thofe of the ftraw fmall, continuing. Sheaths long in proportion to the fize of the plant, ftriated, and a little inflated. Stipula, long and entire. Panicle, branches few, often terminating in threes, diverging. Flowers ovate, very pale purple, with a filvery hue. Calyx valves equal, flightly keeled, and a little rough. Corolla, outer valve larger than the inner, convex, with an awn fixed a little above its bafe; inner valve flightly concave, without an awn; texture of both fingularly hard, and rough on their outfides. Seed, a very fmall tranfparent grain.——Annual; flowering in June.

Common in meadows; does not individually take up much room, and certainly deferves as little as it takes. Mr. Stillingfleet having given a figure of it, in his fifth table of Graffes, I give it here, left, had I omitted it, a good Grafs might have been thought wanting: it is one of the moft infignificant.

VI.

HOLCUS. Calyx, a huſk of two valves, containing two flowers, one floret male, the other hermaphrodite. Corolla, a huſk of two valves, exterior valve awned.

11. HOLCUS LANATUS. *Meadow Soft Graſs.* Root compoſed of ſmall, white, nearly ſimple fibres. Straw bent at the baſe, erect above, ſtriated, leafy, ſmooth, with four or five joints. Leaves flat, downy, thoſe from the root in bundles, ſeven inches long, thoſe on the ſtraw from two to five inches in length. Sheaths downy, inflated, lower ones ſhort, the uppermoſt long. Stipula ſhort, downy, truncated, and toothed. Panicle branches ſhort, in alternate half-whirls, lower ones ſpreading when the flowers are open, all preſſed to the receptacle, when in ſeed; ſometimes five inches long, flowers crowded, calyx downy, white, with a purple tinge. Calyx valves nearly equal in length, pointed, one broader than the other, and three-nerved, the other with one nerve on its keel. Florets both inſerted on one zig-zag foot-ſtalk, the male above the hermaphrodite, not hairy at their baſes. Valves of the corolla firm, ſmooth, ſhining; outer much broader than the inner, convex, the inner a little concave. On the back of the outer valve of the male floret, near its point, is an awn, which at firſt is ſtraight, when the ſeed is ripe it is crooked, ſometimes bent back, ſometimes forward; the awn is always included in the calyx. Seed, a ſmall, oval, yellowiſh-coloured grain. Anthers, purple or yellow. Styles white.——Perennial, flowering from June to Auguſt.

Common in meadows. Is ſaid to be cultivated in ſome parts of Yorkſhire, and its ſeeds ſold under the name of White Graſs Seeds. It is not a good Graſs; particularly, I think, for ruminating animals, becauſe of its woolineſs. Horſes eat it: to them it is ſaid to be hurtful, becauſe of its diuretic quality.

12. HOLCUS MOLLIS. *Creeping Soft Graſs.* Root fibrous, creeping much. Straw erect, with ſometimes ſeven joints, leafy, ſmooth, except at the joints, which are downy, from one to three feet high. Leaves flat, ſhort, broad at the baſe, narrow and ſharp at the point; thoſe from the root in bundles, about three inches long, and half an inch broad at the baſe; thoſe of the ſtraw ſimilar. Sheaths ſhort, a little inflated. Stipula ſhort, rounded and toothed at its top. Panicle erect, from one to three inches long, principal branches in pairs, ſecondary ones crowded, very ſhort and hairy. Calyx valves equal in length, keeled, rough on the keel, and ſharp-pointed; inner valve three-nerved, outer valve one-nerved. Florets, hermaphrodite, and hairy at their baſes. Corolla, outer valve broader than the inner, convex, firm, ſhining; inner valve membranous, a little concave in its middle, edges bent inward; the outer valve of the uppermoſt floret has a twiſted awn near its top, which extends beyond the calyx. Anthers yellow. Styles white. Seed, a ſmall oval grain.——Perennial, July and Auguſt.

Deſerves to be known only to be deſtroyed. Common in meadows and on hedge-banks.

13. HOLCUS AVENACEUS. *Oat-like Soft Graſs.* Root tuberous; tubers moſtly in pairs, one above the other, accompanied with very ſtrong, branched, hairy fibres. Straw erect, from two to five or ſix feet high; jointed, leafy, ſmooth. Leaves from the root ſheathing, a foot long, thoſe on the ſtraw nine inches long, dark-green, near half an inch broad; margins rough on the upper ſide, ſmooth beneath. Sheaths of the radical leaves ſhort, thoſe of the ſtraw long; uppermoſt, very long. Stipula ſhort, blunt, toothed. Panicle nine inches long, erect while young, drooping when its ſeeds are ripe, from their weight; in alternate half-whirls, lower branches irregular, ſome of them very long; upper branches all ſhort. Calyx valves very unequal, white, membranous; inner one large, with three green nerves; outer one ſmall, with one green nerve. Male floret ſitting, hairy at the baſe; a little above, on its back, is a long, twiſted, inflexed awn. Hermaphrodite floret a little elevated, with a ſhort ſtraight awn on the back of the exterior valve, near its point. Exterior valves of

the flowers of firm texture, nerved, and a little downy; interior valves membranous, narrower and ſhorter than the others, a little concave in the middle, with two green nerves. Anthers purple. Styles white. Seed, a grain nearly reſembling, and about one-third the ſize of the cultivated Oat.——Perennial, June to Auguſt.

Common Knotted Couch Graſs. A very pernicious weed in cultivated ground; grows much in hedges, producing ſeed abundantly, which ſhould be prevented from ripening, by cutting the plant when in flower.

VII.

SESLERIA. Calyx, a huſk of two awned valves, often three-flowered. Corolla, a huſk of two valves; outer valve with three, inner with two teeth.

14. SESLERIA CŒRULEA. *Blue Moor Graſs.* Root creeping a little, fibres long, ſtrong, downy, and not much branched. Straw a foot high, with one joint at its baſe, near which are two or three leaves; above it is naked, ſtriated, and ſmooth. Leaves ſtrap-ſhaped, blunt, thoſe from the root (in its wild ſtate) two inches long, and very narrow; when cultivated, they are ſix inches long, and broad in proportion; leaves on the ſtraw very ſhort: all its leaves are a little rough on their backs and margins. Sheaths on the ſtraw three; the loweſt half an inch long, ſecond one inch, and the third three inches and a half. Stipula very ſhort, ſometimes obſolete. Spike ſhort, blunt, varying in colour, from blue to brown; lower lobes on very ſhort foot-ſtalks. There are membranous braceæ, or floral leaves, placed by one, two, or three, at the baſes of the lobes, cloſely embracing the rachis or receptacle. Calyx valves nearly equal, ovate, keeled, membranous, each with a ſhort awn. Corolla, valves membranous, nerved, outer with three teeth, the middle tooth longeſt; inner valve with two teeth. Anthers ſtrap-ſhaped. Styles white. Stigmas awl-ſhaped and downy. Seed, a downy oval-ſhaped grain.——Perennial, flowers in April.

A native of calcareous ſoils: improves much by cultivation. The flowering ſpecimen, given in this Faſciculus, is the plant in its wild ſtate, from barren, calcareous ſoil, near Cleadon, Durham. The radical ſhoot was cultivated in ſandy ſoil, near Gateſhead, Durham. One plant produced eighty ſuch ſhoots as are here given, with only three flowering ſtems. Whether cattle like it, or not, I cannot tell: it has nothing unpromiſing in its appearance, and its taſte is pleaſant.

VIII.

POA. Calyx, an ovate keeled huſk, with two valves; many-flowered. Corolla, a huſk of two valves, without awns.

15. POA AQUATICA. *Reed Meadow Graſs.* Root jointed, creeping, with whirls of fibres at the joints. Straw four to ſix feet high, two-edged, leafy, ſtriated, jointed, ſmooth. Leaves ſword-ſhaped, acute, rough on the backs and margins. Sheath ſtriated, keeled, ſmooth. Stipula ſhort, terminated by a very ſharp point. Panicle large, and very much branched; primary branches in half-whirls, ſecondary branches alternate and zig-zag, many-flowered. Calyx valves nearly equal, membranous, white, keeled, ovate, blunt. Flowers, from five to eight. Corolla, outer valve convex, with ſeven nerves; larger than the inner, which is concave and nerveleſs. Anthers purple: ſtyles ſmall and white. Seed, a very ſmall oval grain, white, covered with a dark-brown pellicle.——Perennial, July and Auguſt.

Grows in both ſtanding and running waters. Is ſaid to be very grateful to cattle. My obſervation does not agree with the foregoing aſſertion; but the waters in which it grows, near Gateſhead, being impregnated with iron, is perhaps the cauſe why cattle do not eat it in theſe places. I have tried its ſeeds in dry ground, but without ſucceſs.

16. Poa fluitans. *Flote Meadow Graſs.* Root creeping, jointed, fibrils at the joints white, nearly ſimple. Straw jointed, leafy, often ſwimming; in dry places procumbent, round, ſtriated, ſmooth; from two to four feet long. Leaves flat, blunt, broad, ſtriated, ſmooth, ſheathing in bundles; in water, the upper ones erect and ſmooth, the lower ones ſwimming and wrinkled: lateral ſhoots, two feet long; in dry places, one foot. Sheaths of the laterals ſhort and flat, thoſe of the ſtraw cylindrical, ſtriated, long, ſmooth, and looſe. Stipula long, very thin, point ſmall and ſplit in two. Panicle nearly erect, very long, often much, ſometimes very little branched; flowers cloſe preſſed to the receptacle, from eight to twelve in each calyx, the valves of which are unequal, membranous, and white on the edges; ſlightly keeled, and green at the baſe of the keel. Corolla, outer valve larger, convex, with ſeven green nerves; inner a little concave, with four green nerves. Anthers yellow. Styles white. Seed, an oblong brown grain; falls eaſily out of the huſk; is very ſweet.

Flowers throughout the ſummer; is a perennial. Grows in ſtanding and ſlow running waters: is very grateful to cows and horſes, both which wade to their bellies in mud and water for it. I ſowed ſome of its ſeeds on the 7th. of Sept. 1805, on ſandy ſoil, in a very dry ſituation: on the 20th. of the ſame month the plants were half an inch long; in which ſtate they remained until the ſpring of 1806, not evidently encreaſing in ſize, until April; after which they grew rapidly, and, to my aſtoniſhment, bore the exceſſive drought of the early part of laſt ſummer better than ſeveral other Graſſes which grew near them. Being too much crowded, I pulled them all but one; which is now (Sept. 1ſt. 1806) very luxuriant, having two flowering ſtems, and ſeventy-ſix lateral ſhoots, twelve inches long, and having from four to ſix leaves each.

17. Poa compressa. *Flat-ſtalked Meadow Graſs.* Root creeping, jointed, fibres numerous at the joints, ſtrong, very much branched. Straw leafy, nearly erect, jointed, flat, eighteen inches long. Leaves ſhort, thoſe from the root few; thoſe on the ſtraw ſhort, one from each joint. Sheaths, excepting the uppermoſt, ſhorter than the leaves; ſmooth, ſtriated, and compreſſed. Stipula ſhort and blunt. Panicle erect, blunt, flowers crowded, rachis compreſſed, branches angular, rough, zig-zag, rather inclining to one ſide. Calyx valves nearly equal, the inner a little larger, ſtronger, and more blunt than the outer; both keeled, with a ſlender nerve on each ſide of the keel; flowers commonly ſix in each calyx. Corolla, valves equal in length, outer broader, convex, rigid, with a ſtrong keel; inner a little concave. Seed, a ſmall oblong, bluntly three-cornered grain.——Perennial, June and July.

Grows on dry ſoils. Hearing it ſpoken of as a good Graſs, I was anxious to know it. I found it on barren calcareous ſoil, its roots penetrating deep, and creeping in all directions; flowering ſtems numerous, but with very few lateral ſhoots. What its produce may be on good ſoil I want experience of; its ſtrongly creeping roots would render it a nuiſance on arable land.

18. Poa trivialis. *Rough Meadow Graſs.* Root fibrous, ſmall. Straw crooked at its baſe, erect above; from one to two feet high, jointed, lower joints ſometimes producing roots; is moſtly ſimple, ſometimes branched; leafy, ſtriated, rough, colour often pale purple. Leaves of various lengths, according to ſoil and ſituation; nearly erect, limber, and often wrinkled; keeled, acute; under ſide rough, particularly on the margins. Sheaths, lower ones ſhort, and much compreſſed; uppermoſt often thrice as long as the leaf which terminates it, and nearly cylindrical; all ſtriated and rough. Stipula long, lance-ſhaped, and acute. Panicle, from two to ſeven inches long, very much branched; primary ones in half-whirls, of various lengths; ſecondary ones moſtly in pairs, one longer than the other: foot-ſtalks rough, lower branches ſpreading horizontally after flowering. Calyx

moſtly containing three flowers, valves rough, keeled, nearly equal in length; outer valve lance-ſhaped, ſharp-pointed; inner valve three-nerved, with a dilated margin. Corolla, outer valve broader, convex, and five-nerved; inner valve a little concave near its baſe, two-nerved: baſes of the valves connected by a bundle of white hairs; points blunt, margin of the inner valve ſwollen, green, and downy. Anthers, purple or yellow. Styles white. Seed, a ſmall oval grain.——Perennial, June to September.

Common. Is one of the beſt meadow Graſſes. In moiſt rich ſoil its produce is very great: it is impatient of drought; and, from the ſmallneſs of its root, does not bear being trodden upon: which, I preſume, is the cauſe why I do not ſee it abundant in paſtures. Its ſeeds are not eaſily ſeparated, adhering together by the hairs which are at the baſes of the florets: to cauſe them to go aſunder, in ſowing, they ſhould be mixed with dry ſand, or pulverized loam. My friend, Mr. Wm. Falla, Nurſeryman, of Gateſhead, thinks the latter preferable; becauſe, being lighter than ſand, it would mix better with the ſeeds: his experience, in ſowing different kinds of ſeeds, being great, I ſubmit to his opinion.

19. Poa pratensis. *Smooth-ſtalked Meadow Graſs.* Root creeping, fibres ſmall, much branched, tough. Straw from four inches to two feet high, unbranched, ſtriated, leafy, ſmooth. Leaves ſpreading, blunt, keeled, ſmooth; often dark-green, ſometimes glaucous, ſheathing. Sheaths of the radical leaves ſhort, thoſe on the ſtraw much longer than the leaves which terminate them; ſtriated and ſmooth. Stipula ſhort and blunt. Panicle ſmooth, branched, ſpreading when young, and erect; when its ſeeds are ripe, its lower branches are pendulous; the upper ones cloſe preſſed to the rachis, which becomes curved by their weight: its principal branches are in half-whirls, of unequal lengths; ſecondary branches in pairs, one longer than the other. Calyx valves unequal, acute, keeled, inner larger and three-nerved; outer leſs, and only nerved on the keel, margins of both are membranous: that of the inner rather broader than that of the outer. Flowers, four or five in each calyx. Corolla, outer valve larger, convex, ragged at its point, five-nerved; inner valve narrow, grooved in its middle, margin membranous and downy; baſes connected by a bundle of hairs. Anthers purple. Styles white. Seed, an oblong grain, with three blunt angles.——Perennial. Common. Flowering in May and June; ripening its ſeeds in Auguſt.

This and the preceding retain their ſeeds long, becauſe of the hairs at the baſes of their florets. In ſowing, the ſame method is neceſſary to ſeparate the ſeeds of this, which is recommended for the other. This is a more permanent Graſs than *Poa trivialis*, from its creeping roots; equally ſuiting meadow or paſture. When land is in tillage, where every Graſs becomes a weed, the creeping roots of this make it difficult to deſtroy; which is an objection to its being ſown on ground which is intended to remain only a ſhort while in Graſs.

20. Poa annua. *Annual Meadow Graſs.* Root, a large bundle of ſlender, white, downy fibres, very little branched. Straw leaning, jointed, leafy, ſmooth, branched, and taking root at its lower joints; by which mode of growth the plant increaſes *ad infinitum*. Leaves ſtrap-ſhaped, criſped, ſhort, blunt, a beautiful green. Sheaths pale green, compreſſed, ſmooth, and ſtriated. Stipula rather long, terminated by a ſharp point, Panicle erect, branches in pairs, ſpreading. Calyx valves keeled, green on the keel, with white membranous margins; inner valve larger, and three-nerved; outer nerved on the keel only. Flowers, about five in each calyx. Corolla, outer valve larger, convex, five-nerved, blunt, margin white and membranous, inner valve a little concave, margin ſwollen, green, except at the point, which is white, blunt, and membranous; both valves are downy. Anthers, very pale yellow. Styles white. Seed, a very ſmall oval grain; florets not connected by hairs.

Flowers throughout the ſummer: is a perennial, notwithſtanding its name. Grows in every place where Graſs can grow: makes a moſt beautiful graſs-plot, which is its chief recommendation; being too ſmall to deſerve cultivation as food for cattle, at leaſt as a meadow Graſs.

IX.

BRIZA. Calyx, a huſk of two valves, many-flowered. Corolla, a huſk of two blunt valves.

21. Briza media. *Common Quaking Graſs.* Root fibrous, much branched, and downy. Straw a foot and a half high, erect, leafy, cylindrical, and ſmooth; joints, two or three. Leaves ſheathing, erect, lance-ſhaped, ſtriated, rather rough. Sheaths on the root leaves ſhort; on the ſtraw long, ſtriated, cylindrical, and ſmooth. Stipula, very ſhort and blunt. Panicle branched, ſpreading, branches weak: flowers pendulous, trembling, foot-ſtalks brown. Calyx valves nearly equal, boat-ſhaped, blunt, ragged on the margin, ſmooth on the keel, three-nerved at the baſe, the middle nerve only extending to the point. Flowers, from five to nine, ranged alternately, making a ſhort blunt ſpiket. Corolla, of two unequal valves, one encloſing the other; outer reſembling the calyx, inner membranous, ſlightly two-nerved, and a little concave in its middle. Seed, a ſmall bluntly triangular grain, gibbous on one ſide, and hollow on the other.——Perennial: May and June.

A native of high paſtures. I have heard this recommended as a good Graſs for ſheep; but, from obſervation, find that they are not partial to it. Neither do cows or horſes regard it much; it remains untouched in the paſtures, where it is common, after moſt other Graſſes are eaten.

X.

DACTYLIS. Calyx, a huſk of two compreſſed valves, one rather larger than the other. Corolla, a huſk of two valves.

22. Dactylis glomerata. *Rough Cocks-foot Graſs.* Root compoſed of ſhort, ſtrong, downy fibres. Straw two feet high, erect, jointed, and leafy near its baſe, naked above. Leaves ſtrap-ſhaped, acute, long, ſpreading; varying in colour, from very dark to very pale green: having a ſtrong nerve or midrib; on which, and on their margins, they are very rough. Sheaths ſtriated, compreſſed, ſharply two-edged, and rough on their edges. Panicle irregularly branched, branches diſtant, angular and very rough. Flowers crowded, placed on one ſide of, and at the extremities of the branches. Calyx valves unequal, keeled, and nerved on the keel; on which, and on their edges, they are hairy; texture, except on the keel, membranous. Flowers, three or four in each calyx. Corolla, valves unequal, larger than the calyx; outer valve five-nerved, convex, ſharp-pointed, keeled, hairy on the keel, hairs arranged like the teeth of a comb; inner valve a little concave, and hairy on its margin. Anthers, purple or pale yellow. Styles white. Seed, an oblong, bluntly triangular grain. Perennial. June to September.

Common in meadows, and near hedges; yields great weight of crop, and ſhoots freely after being cut: its after-math, or fog, is grateful, both to cows and horſes. In paſtures it appears only ſparingly; its lateral ſhoots being thick, and cluſtering at their baſes, and its roots ſhort, it is eaſily trodden out. A field near my reſidence, a few years ago, produced much *Cocks-foot Graſs*, which, in one ſeaſon, was nearly all deſtroyed, by a number of oxen being fed with turnips on it.

XI.

CYNOSURUS. Calyx, a huſk of two valves, many-flowered. Proper receptacles leafy, placed on one ſide of the rachis or common receptacle. Corolla, a huſk of two valves.

23. CYNOSURUS CRISTATUS. *Creſted Dog's-tail Graſs.* Root compoſed of ſtrong, rather woody, downy, fibres; yellow within. Straw erect, one to two feet high, jointed, and leafy on its lower part, cylindrical, upper part ſmooth and naked. Leaves ſtrap-ſhaped, a little channeled, keeled, acute, ſmooth, and finely ſtriated on both ſides; thoſe of the lateral ſhoots, in crowded ſheathing bundles, of about four in each bundle, from three to ſeven inches long: leaves on the ſtraw ſhort. Sheaths of the lateral ſhoots very ſhort; thoſe on a ſtraw of two feet, the firſt one inch, ſecond two, third three, and the fourth and uppermoſt four inches long, cylindrical, ſtriated, and ſmooth. Stipula rather ſhort and ragged. Spike ſlender, erect, blunt; rachis zig-zag, angular, and ſmooth. Calyx valves nearly equal, ſharp-pointed, keeled, green, and hairy on their keels; margins membranous, white, and ſmooth. Flowers, from three to eight in each calyx; calyces moſtly in pairs, with two or three bracteæ, or floral leaves, at the baſe of each pair; winged, with two alternate rows of narrow leafets, toothed on their lower, and membranous on their upper margins; each ſucceeding pair ſhorter than the pair next below, ſo that their points are nearly level at the top. Corolla, outer valve convex, ſcarce viſibly keeled, except near its point; rough from the baſe to above the middle, from whence to the point, which terminates in an awn, it is ſpinous; inner valve ſcabrous, equal in length to, but narrower than the outer; concave in its middle, edges turned in, point ſharp. The corolla is yellow when the ſeed is ripe, which is a ſmall oval grain. Anthers purple. Styles white. ——Perennial: July and Auguſt.

A valuable paſture Graſs, very permanent; grateful to ſheep, cows, and horſes. Makes a beautiful lawn, or graſs-plot.

XII.

FESTUCA. Calyx, a huſk of two ſharp-pointed valves. Corolla, a huſk of two ſharp-pointed valves; outer valve often awned.

24. FESTUCA OVINA. *Sheep's Feſcue Graſs.* Root fibrous. Straw ſmall, erect, nine inches long, with one joint at the baſe, and two above: leafy on the lower part, and cylindrical to the third joint; above which it is angular, and is naked and ſquare at the top. Leaves ſheathing, ſmall as hogs' briſtles; lateral ſhoots crowded in bundles, of from four to eight leaves in each bundle. Sheaths ſhort, and membranous on the lateral ſhoots, on the ſtraw the loweſt ſheath is half an inch, the ſecond one and a half, and the third three inches long; angular, cloſely embracing the ſtraw. Stipula very ſhort. Panicle branches ſo ſhort that it becomes ſpike-formed after flowering; receptacle zig-zag and rough. Calyx valves unequal, keeled, and ſharp-pointed; inner valve larger, and three-nerved, outer nerved on the keel only. Flowers, four or five in each calyx. Corolla, outer valve larger, convex, with three ſmall nerves from the baſe, to a little above its middle; tubercled near its point, which is ſometimes awned: inner valve rather ſhorter and narrower than the outer, concave in the middle, margins revolute, point ſharp. Anthers purple. Styles white. Seed, a ſmall oval grain.——Perennial: June.

Common on moors, and in high paſtures. Sheep are extremely fond of this Graſs; where it abounds, if the ground be ſtocked with them, it is hardly poſſible to find a plant of it unbitten. I obſerved at Langley Moor, near Lancheſter, in the County of Durham, in July, 1806, very fat lambs, and the ewes more than half fat, where the Graſs was not generally above four inches long: the herbage conſiſting principally of Trifolium repens, White Clover; Decumbent Meadow Graſs, Annual Meadow Graſs, Hard Feſcue Graſs, and Sheep's Feſcue Graſs. The white clover predominated, and, in the Farmer's idea, had fattened his lambs. After looking cloſely myſelf, I requeſted him to find me ſome of the ſtems of the clover, with its leaves bitten off, which he could not; we then examined the Graſſes, and could find none of the leaves of the Sheep's Feſcue unbitten.

25. Festuca duriuscula. *Hard Feſcue Graſs.* Root compoſed of ſtrong, branched, downy, brown fibres. Straw ſometimes two feet high, cylindrical; except near its top, where it is angular, and a little compreſſed; joints two, one at the baſe, the other a little above. Leaves on the lateral ſhoots very narrow, briſtle-like; thoſe on the ſtraw, one from each joint, are flat, broader than thoſe from the root, ſometimes downy on the upper ſurface, but oftener ſmooth. Sheaths of the radical leaves long, thoſe on the ſtraw two, lower one ſhort, upper one long; both cylindrical, ſtriated, and ſmooth. Stipula ſhort and blunt, in ſome plants hardly diſcernable. Panicle often bent when young, moſtly erect when its ſeeds are ripe, irregularly branched; loweſt branches on long, rough, angular foot-ſtalks; ſhortening above, ſo that the uppermoſt flowers ſit cloſe on the rachis. Calyx valves unequal, lance-ſhaped, ſharp-pointed, keeled, and ſmooth; the inner valve has three nerves, the outer only one. Corolla, outer valve convex, keeled, ſlightly tri-nerved at its baſe, awned, ſmooth, except near its point where it is a little rough; inner valve narrower than the outer, reaching to the baſe of the other's awn; concave, ſharp-pointed, and downy on its margins. Anthers purple. Styles white. Seed, a ſmall oblong grain.——Perennial: June and July.

Common in meadows and paſtures; more valuable in the latter, being ſweet, nutritive, and grateful to ſheep, cows, and horſes. Notwithſtanding the ſmallneſs of its leaves, in good ſoil it is luxuriant, making up, by numbers, what it lacks in ſize. All my objection to it, as a meadow Graſs, is, that, from its being narrow and ſmooth, it is liable to eſcape the rake.

26. Festuca gigantea. *Giant Feſcue Graſs.* Root compoſed of white, very ſtrong, downy fibres. Straw often above four feet high; joints three near the bottom; cylindrical, ſmooth, leafy below, naked above. Leaves from the root in ſheathing bundles, of three or four; from one to two feet long; thoſe on the ſtem from four to nine inches long, and from a quarter to half an inch broad; keel prominent on the backs of all the leaves; under ſide ſmooth and ſhining, dark green; upper ſide a little glaucous, and finely ſtriated; edges rough. Sheaths of the lateral ſhoots very ſhort; thoſe on the ſtem commonly three, the firſt aſcending half way up and embracing the ſecond; the ſecond embracing the baſe of the third; the firſt and ſecond ſhort, and rather looſe; the third a perfect cylinder, long, and cloſely embracing the ſtraw. Stipula, very ſhort on the lower ſheaths, and nearly entire; rather longer on the uppermoſt, and ragged; colour, pale purple. Panicle long, bending, branched below, flowers ſitting at the point; branches pendulous, foot-ſtalks triangular, loweſt ones two inches long; rachis a half-cylinder, ſharply two-edged, from the loweſt to the third branch, above which it is compreſſed on both ſides. Calyx valves rather unequal, ſlightly keeled, green, tinged with purple; inner three-nerved, outer one-nerved; nerves white, margins white, and membranous; points ſharp; flowers, about ſeven in each calyx. Corolla green, daſhed with purple on the outer valve, which is ſlightly keeled, and five-nerved near its point, terminated by a very long awn; the inner valve is almoſt white, nearly equal in ſize to the outer, concave, with a revolute toothed margin, and ragged point. Anthers ſmall, yellow. Styles white. Seed, an oblong, purple grain, convex, on one ſide and channeled on the other.——Perennial: July, Auguſt, and September.

Common in woods. Its luxuriant appearance caufed me to think it worthy of being withdrawn from its retirement; but, on trial, although it is fweet, I find it is too tough to be nutritious. Cattle eat it, I fear, from neceffity, not choice. In the places where I have feen it moft plentiful, Juncus fylvaticus, Wood-rufh, and Bromus afper, (Rough Brome Grafs), are its conftant companions. Cattle choofe it rather than either of its neighbours; but would certainly refufe it alfo, could they get better.

27 FESTUCA PRATENSIS. *Meadow Fefcue Grafs.* Root fibrous, ftrong, downy, and white. Straw commonly about two feet high, cylindrical, leafy below, naked above: joints about three, fwollen, and crooked; one at the bafe, the next one inch above, and the third about four inches above the fecond. Leaves, a fine light green, keeled, fmooth, about three-eighths of an inch broad; lateral fhoots a foot long, in fheathing bundles of four leaves each; loweft leaf on the ftraw about fix inches long, uppermoft about three. Sheaths cylindrical; on the lateral fhoots and bafe of the ftraw fhort, the uppermoft on the ftraw long. Stipula very fhort, white. Panicle bending, branches in pairs, one longer than the other, on very fhort, compreffed foot-ftalks: alternate, at unequal diftances, to near the top of the receptacle, where the flowers are fitting: rachis a half-cylinder, from the loweft to the third pair of branches, fharply two-edged, above which it is flat on both fides. Calyx, inner valve green on its back, with three white nerves, flightly keeled, edges membranous, white, point blunt; outer valve lefs, green on its back, with one white nerve: edges white, membranous, point blunt. Flowers, about feven in each calyx. Corolla, valves nearly equal, outer convex, green, fmooth at its bafe, rather rough, and five-nerved near its point, which is moftly unawned and ragged: inner valve concave, and white in its middle; edges green, revolute, and downy, point ragged. Anthers yellow. Styles white. Seed, an oblong, brown, grain; convex on one fide, and deeply grooved on the other.——Perennial: June to Auguft.

Grows in the meadows near Gatefhead, but fparingly: feems worthy the Agriculturift's notice, as it promifes to yield much hay. Its profufe flowering renders it lefs defirable as an inhabitant of the pafture.

28 FESTUCA ELATIOR. *Tall Fefcue Grafs.* Root fibrous, fibres very downy, and ftrong; defcending deep into the earth. Straw fometimes above fix feet high, jointed, and leafy from its bafe to within ten inches of the panicle. Leaves on the lateral fhoots, fometimes three feet long; on the ftraw one foot, half an inch broad at the bafe, ending in a fharp point; keeled, and fmooth beneath, deeply ftriated on the upper fide, and rough on the edges. Sheaths cylindrical, fmooth; thofe on the lateral fhoots, and lower part of the ftraw, fhort, thofe uppermoft on the ftraw very long. Stipula green, fhort, and blunt. Panicle often above a foot long; lower part branched in pairs, foot-ftalks compreffed, and toothed on their edges, unequal in length, the pair at the bafe longeft; thofe above fucceffively fhorter, until the flowers become fitting at the top of the rachis, where it is flat on both fides, and toothed on its edges: from the bafe to the third pair of branches it is a half-cylinder, with blunt, fmooth edges. Calyx valves unequal, lance-fhaped, fharp-pointed, flightly keeled; inner valve green on its back, with three white nerves, edges and point white, and membranous; outer valve green on its back, with one white nerve, edges and point white and membranous. Corolla, valves nearly equal in length, outer one broader, convex, fcarce vifibly nerved at its bafe; above it is five-nerved; the four lateral ones ceafing beneath the point, the middle one extending to its extremity, and when young, winged with a white membrane, which falls off with age, and then the point of the nerve refembles an awn: inner valve concave, white on its middle and lower part, margins green; immediately below the point purple, at the extremity white. Anthers yellow. Styles white. Seed purple, about a line and a half long, and half a line broad; convex on one fide, and grooved on the other.——Perennial: June to Auguft.

Common on the banks of rivulets, where, by its numerous roots, it prevents the otherwise often loose soil from crumbling. Its near resemblance to the Meadow Fescue Grass induced me to suppose it might be worth cultivating; but, on trial, I find it too tough and harsh to contain much nutrition; so that I cannot recommend it for any thing but its above-named mechanical property. The late Mr. Wm. Curtis, in his excellent pamphlet on Grasses, remarks, that the seeds of this, when cultivated, are not fertile. I gathered seeds of it, in its native situation, and sowed them, Sept. 10, 1805: they were productive, and the plants which arose from them are now in seed, Sept. 6, 1806; but none of the seeds are perfect, all being black, friable, and some of them very much swollen: which evils are caused, I think, by the *larvæ* of an insect.

XIII.

BROMUS. Calyx, a husk of two valves. Corolla, a husk of two valves; outer valve with an awn fixed beneath its point; edges of the inner valve fringed with hairs.

29. Bromus mollis. *Soft Brome Grass.* Root fibrous, branched, short, and rather woody. Straw cylindrical, jointed, downy, about two feet high. Leaves flat, downy, sheathing; those from the root few, shorter and narrower than those on the straw, which are mostly two, the uppermost longest; the contrary of which is the case in most other Grasses. Stipula short, acute. Panicle branched on its lower part, foot-stalks unequal in length, in half-whirls; angular, downy, mostly terminated with a single calyx; the lowest foot-stalk sometimes bearing two or three calyces: two sitting spikets mostly terminate the rachis, one a little below, the other at the point. Calyx, inner valve larger, five-nerved, edges membranous, point blunt: outer valve less, three-nerved, and sharper pointed than the inner. Flowers, about seven in each calyx. Corolla, outer valve convex, seven-nerved; edges membranous, finely toothed, point divided; a little below which, a straight rough awn is fixed, equal in length to the valve: inner valve a little concave, membranous in its middle, and at its point, which is blunt and often ragged: borders green, fringed with white hairs. Anthers yellow. Styles white. Seed, convex on one side, and grooved on the other.——Annual or biennial. June to September.

Far too common: is often sown as a first crop, either intentionally, or perhaps may predominate in first crops, from its seeds being the only fertile ones the hay-loft yields. Obtains the name of *Hostler's-Hay*, from suiting the interests of those people better than the palates of the horses they give it to; for a horse must, I think, be very hungry before he will eat it.

XIV.

AVENA. Calyx, a husk of two valves, many-flowered. Corolla, a husk of two valves; outer valve with a twisted awn on its back.

30. Avena pubescens. *Downy Oat Grass.* Root creeping a little, fibres much branched, long, and downy. Straw nearly cylindrical, jointed, and leafy; joints contracted, commonly three. Leaves spreading, rather broad, short, flat, and downy on both sides. Sheaths long, on the lateral shoots compressed, purple; on the straw, striated, keeled, and loose. Stipula long and ragged. Panicle branched below; foot-stalks of various lengths, in half-whirls, nearly cylindrical, rough, flowers sitting near the top. Calyx valves, inner large, and three-nerved, outer smaller, one-nerved; point sharp, sometimes divided. Corolla, outer valve larger, with one nerve on its middle, from the base to the insertion of the

awn: on each ſide of the awn, beginning near its baſe, are other two nerves, which extend nearly to the point of the valve; inner valve nearly as long, but narrower than the outer, its edges rolled outwards, point membranous and divided. Anthers purple. Styles white. The flowers are ſupported by a hairy foot-ſtalk. Seed, reſembles that of the common cultivated Oat, but is much leſs.——Perennial: June.

Moſt common on calcareous ſoils: improves much by cultivation, and nearly loſes its character. My flowering ſpecimens ſhew the plant in its wild ſtate; the lateral ſhoots exemplify its improvement by cultivation. In the autumn of 1804 I planted the baſe of a flowering ſtem, at which there was only one ſmall root-fibre: in September, 1806, I took up its produce, which, without having been previouſly divided, had increaſed to 64 flowering ſtems, and 221 lateral ſhoots, from eighteen inches to two feet long; having from three to four leaves each, which were a fine dark green, and very little downy: it weighed, with the root, one pound ten ounces, avoirdupoiſe. The greateſt hindrance to its cultivation, is its producing fertile ſeeds ſparingly.

31. Avena flavescens. *Yellow Oat Graſs.* Root fibrous, ſmall, very little branched, rather woody. Straw cylindrical, leafy on its lower part, naked above, jointed; joints three or four, downy, bent at its baſe; upper part erect, two feet high. Leaves flat, narrow, ſlender, a little downy, and ſheathing. Sheaths of the lateral ſhoots three; the firſt aſcending nearly to the top of, and embracing the ſecond; the ſecond aſcending to the middle of, and embracing the third; very downy; thoſe of the ſtraw long, cylindrical, and ſmooth. Stipula ſhort, blunt, and ragged. Panicle branches in half-whirls; foot-ſtalks ſlender, rough, the loweſt longeſt; ſhortening, in ſucceſſion, until the uppermoſt ſpiket ſits on and terminates the rachis, which is nearly cylindrical, and ſmaller than a horſe's hair at its top. Calyx, valves acute, keeled, and rough on their backs: inner much larger than the outer, three nerved; the outer has only one nerve. Flowers, about three in each calyx. Corolla, outer valve with a long, crooked, rough awn on its back, a little above its middle; ſcarce viſibly nerved below the awn, from the baſe of which two nerves extend to the point of the valve, which is membranous and divided; inner valve narrow, membranous, and white. Anthers yellow. Styles white. Colour of the panicle yellow green, mixed with white, (ſometimes, but rarely, it is purple and white,) ſhining. Seed, long, and very narrow; convex on one ſide, and grooved on the other.——Perennial: June to Auguſt.

Common in meadows and paſtures. Yields little but flowering ſtems to the ſcythe: ſhoots pretty freely after being cut; but bears ſo ſmall a proportion, in weight, to our beſt meadow or even paſture Graſſes, that I think it is hardly worth cultivating.

XV.

ARUNDO. Calyx, a huſk of two valves. Corolla, a huſk of two valves, ſurrounded with wool at its baſe.

32. Arundo colorata. *Canary Reed Graſs.* Root creeping, fibrous white, branched, and very ſtrong. Straw leafy, jointed, erect, five feet high. Leaves ſheathing, on the lateral ſhoots from four inches to a foot long, half an inch broad at the baſe, tapering to a ſharp point; thoſe on the ſtem rather narrower, in other reſpects ſimilar; flat, with a narrow, ſharp keel, and deeply ſtriated; not hairy or downy. Sheaths nearly cylindrical, rather looſe; on the lateral ſhoots four inches long, the lower embracing the baſe of the next above it, in ſucceſſion, until the laſt is terminated by a bundle of ſpreading leaves; ſheaths on the ſtraw longer, each terminated by one leaf. Stipula rather long, ragged, and blunt. Panicle erect, branches alternate, in pairs, on ſhort, unequal, nearly ſmooth, thread-ſhaped, foot-ſtalks; loweſt pair longeſt; thoſe above ſhorter, in ſucceſſion, until the

uppermoſt cluſter of flowers reſts upon and terminates the rachis; which is nearly cylindrical, and ſmooth below, compreſſed above, and rough on its edges. Valves of the calyx nearly equal, compreſſed, keeled, three-nerved, and pointed. Valves of the corolla unequal; both convex, keeled, and hairy on their backs; when the ſeed is ripe, aſh-coloured and ſhining; outer valve five-nerved, cloſely enfolding the inner, which is narrower than the other, and ſcarce viſibly nerved. Anthers, moſtly purple. Styles white. Calyces numerous, cluſtered, containing each one flower, the wool at the baſe of which is very ſhort. Seed, a very ſmall dark-brown, oval grain.——Perennial: June.

Common on the banks of rivulets and ditches: Here it is recommended as uſeful, in giving conſiſtency to the banks of waters where the ſoil is too looſe. It yields abundance of fertile ſeeds.

33. Arundo arenaria. *Sea Reed.* Root creeping, to an indefinite length, with joints two inches diſtant from each other; at every joint is a whirl of long, white, and very ſtrong, branched fibres. Straw rather leaning, cylindrical, jointed, two feet long, often leafy to within two inches of the panicle. Leaves ſheathing; thoſe from the root in bundles of three or four, from five to fifteen inches long, and one-fifth of an inch broad at the baſe, tapering to a very ſmall and ſharp point; dark green, and finely ſtriated on the under-ſide: glaucous, and deeply ſtriated on the upper ſurface; margins ſmooth, moſtly rolled up, ſo as to appear cylindrical; thoſe on the ſtraw ſimilar in form, but ſhorter. Sheaths on the lateral ſhoots brown, ſmooth, ſtriated, nearly cylindrical; about four inches long: thoſe on the ſtem green, uppermoſt ſix inches long, ſtriated, and rather looſe. Stipula half an inch long, with two ſtrong and many ſmall nerves; pointed, and divided at the point. Panicle erect, flowers crowded, ſo that it reſembles a ſpike; foot-ſtalks ſhort, thoſe occupying the middle of the rachis longeſt; thoſe at the top ſitting: the rachis is nearly cylindrical, from its baſe half-way up; above which it is angular, and a little rough. Valves of the calyx large, nearly equal, compreſſed, ſharp-pointed, keeled, and fringed with hairs on the keel; contains one flower. Valves of the corolla unequal, five-nerved, ſharp-pointed; outer larger, with a ſhort awn a little beneath its point; it cloſely enfolds the inner, which is not awned. Anthers brown. Styles white. I have not ſeen its ſeeds.——Perennial: June.

Common in ſandy places, near the ſea. By its numerous and long roots it holds the ſand together, and prevents the water from encroaching on the land.

XVI.

LOLIUM. Calyx, a huſk of one valve, fixed cloſe to the rachis; many-flowered. Corolla, a huſk of two valves.

34. Lolium perenne. *Perennial Darnel. Ray Graſs.* Root fibrous, fibres white, downy, branched a little. Straw from one to two feet high, often ſlightly compreſſed, with two crooked, ſwollen joints; one near its baſe, the other four inches above; leafy half its length; very ſmooth, ſtriped with ſmall white and green lines. Leaves ſheathing, keeled, and dark green on the under-ſide; a little channeled, ſtriated, and light green on the ſurface; lateral ſhoots few, their leaves narrow; the ſtem generally produces two leaves, rather broader than thoſe of the lateral ſhoots. Sheaths a little compreſſed, ſmooth, thoſe on the laterals, and the loweſt on the ſtraw, ſhort; uppermoſt on the ſtraw long. Stipula ſhort, blunt, cloſely embracing the ſtraw. Spike bending a little, flowers alternate, ſpikets flatted, placed edge-ways on the rachis, which is a little compreſſed, alternately hollowed, to receive the flowers, and rounded on the edge oppoſite to each of them. The terminating ſpiket has a two-valved calyx. Valve of the calyx near half an inch long, ſlightly ſeven-nerved, green, ſprinkled with minute ſcabrous white ſpots; margins

membranous, point blunt. Valves of the corolla unequal, outer broader, convex, ſeven-nerved from a little above its baſe to near its point, to which only the middle one extends; edges and point membranous, the latter blunt, inner valve concave, membranous, and white on its middle and point, which is blunt; margins green, edges ſinely toothed. Anthers, pale purple, or yellow. Styles white. Flowers, about nine, ſometimes twelve, within each calyx. Seed, an oblong grain, convex on one ſide and deeply grooved on the other.——Perennial: June to September.

Common. Is deſervedly ranked among the beſt Graſſes; but does not deſerve to be ſelected in preference to all the reſt. I do not know that any Graſs is more grateful to cattle than this; but ſeveral ſurpaſs it in yielding weight of crop, both to the ſcythe and after having been cut.

XVII.

TRITICUM. Calyx, a huſk of two valves, many-flowered; ſpikets alternate, ſitting cloſe upon the rachis, which is zig-zag. Corolla, a huſk of two valves.

35. Triticum repens. *Creeping Wheat Graſs. Couch Graſs.* Root creeping in every direction; ſuckers jointed at ſhort intervals, every joint producing fibrous roots. Straw from two to ſix feet high, nearly erect, jointed, and leafy. Leaves ſheathing, keeled, rather broad, rough, and harſh; from nine inches to more than a foot long. Sheaths cylindrical, ſmooth; on the lateral ſhoots numerous and ſhort; on the ſtem four, often more; the loweſt ſhorteſt and the uppermoſt longeſt. Stipula very ſhort. Spike nearly erect, from three to ſeven inches long, ſpikets compreſſed, alternate, edges tranſverſe to the rachis, which is zig-zag, hollowed on the ſide next the flowers, and toothed; rounded on the other, and ſmooth. Valves of the calyx nearly equal, keeled, nine-nerved; edges membranous, points awned. Valves of the corolla unequal; outer larger, convex, ſeven-nerved, awned, ~~and~~ aux ſometimes very ſhort; inner valve leſs, concave, membranous, and white in its middle, edges green, toothed, point blunt. Flowers, ſometimes ſeven in each calyx. Anthers pale yellow. Styles white. Seed ſmall, ſomething reſembling in form the grain of the cultivated Wheat; nectarium adhering to its baſe.——Perennial. June to September.

Much too common: when it once gets eſtabliſhed in arable land, is more difficult to deſtroy than almoſt any other weed. When gathered off the ground it ſhould be burned, for it is ſcarcely deſtructible otherwiſe, recovering ſo far as to vegetate, after ſeeming quite dry. I have been informed that a cloſe crop of Potatoes has been known to eradicate it, where it was abundant. There is ſome probability in the report, for it is not common in meadows or paſtures. It is frequent on the borders of fields, and in hedges, where I would recommend its being cut before its ſeeds ripen. It does not bear fertile ſeeds profuſely, yet it bears ſome, and one plant would ſoon over-run a whole field.

A TABLE,

SHEWING THE PRODUCE OF THIRTEEN GRASSES,

FROM ONE SEED OF EACH;

Sown in September, 1805, *and taken up in September*, 1806;

Specifying the Diameter of the Space occupied by each Plant,—the Number of flowering and lateral Shoots,—Length of the lateral Shoots,—and their different Weights, with and without their Roots.

	Space occupied.		Flowering Stems.	Lateral Shoots.	Length of L. Shoots.		Weight with Root.		Weight without Root.	
	Feet	*In.*	*No.*	*No.*	*Feet.*	*In.*	*lb.*	*oz.*	*lb.*	*oz.*
1. Anthoxanthum odoratum -	0	9	3	199	0	10	0	4	0	2
2. Phleum pratenſe - - - -	0	10	9	91	1	1	0	6½	0	4
3. Alopecurus pratenſis - - -	1	2	0	115	1	3	0	4¼	0	2
4. Aira flexuoſa - - - - -	0	5	0	285	0	6	0	1½	0	1
5. Poa fluitans - - - - - -	0	5	2	76	1	0	0	3¼	0	1¼
6. Poa trivialis - - - - - -	0	9	17	263	0	9	0	4	0	2¼
7. Poa pratenſis - - - - -	0	7	0	84	2	0	0	4¾	0	2¾
8. Dactylis glomerata - - -	1	4	1	120	1	6	0	14½	0	9¾
9. Cynoſurus criſtatus - - -	0	4½	0	69	0	9	0	1¼	0	0¾
10. Feſtuca duriuſcula - - - -	0	6	0	273	1	3	0	6¼	0	2¾
11. Feſtuca pratenſis - - - -	1	0	48	215	1	2	0	13¼	0	8
12. Avena flaveſcens - - - -	0	3	26	74	0	9	0	1	0	0½
13. Lolium perenne - - - -	0	4	1	31	0	7	0	0½	0	0¼

The experiment which furniſhed materials for the Table given above, though ſmall, was carefully attended to, and the numbers, weights, and meaſures accurately taken. All the Plants grew on the ſame ſoil, and ſo far diſtant, as not to intrude upon each other. It muſt not be inferred, from the Table, that the heavieſt Graſſes are decidedly the beſt; but that, where a mixed crop of them is required, fewer ſeeds of the coarſe and large kinds muſt be ſown, and more of the finer and ſmaller kinds.

The

Righ
Sir J
Mr.
Char
Thor
Calv
Mr.
Mr.
J. C.
Edward
Mr. R
Joseph
Mr. Jo
Cubb
Rev. W
Mr. Wi
G
Rev. R
Mr. Tho
Mr. Wil
Mr. Willi
T. W. Gr
Mr. Grac
Mr. Ralph
Mr. Willi
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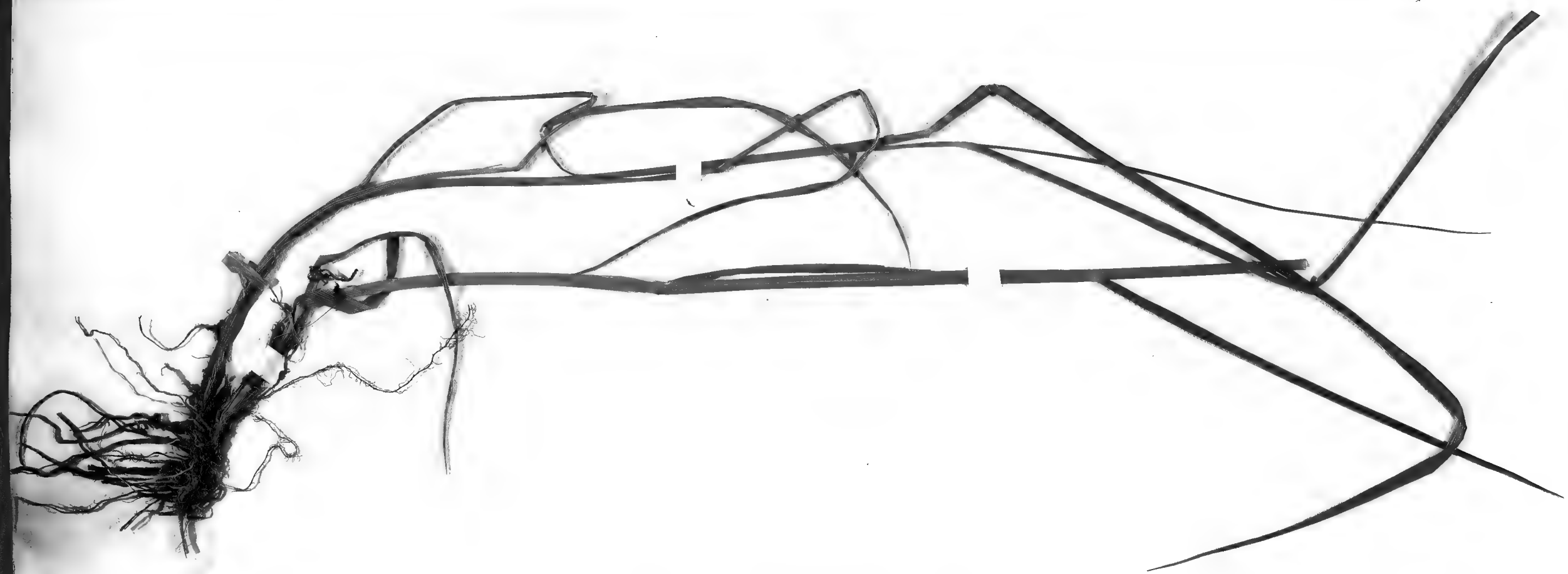

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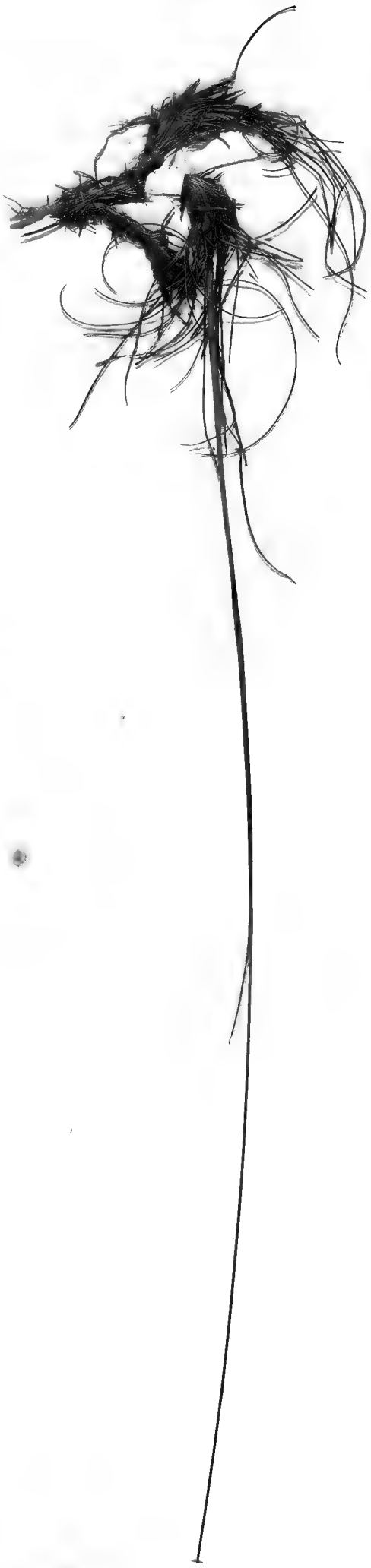

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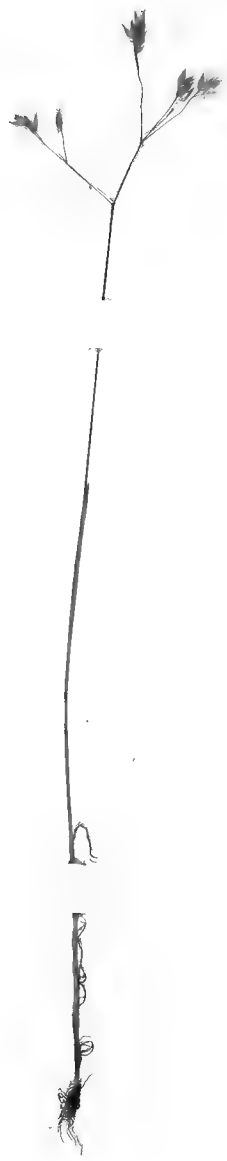


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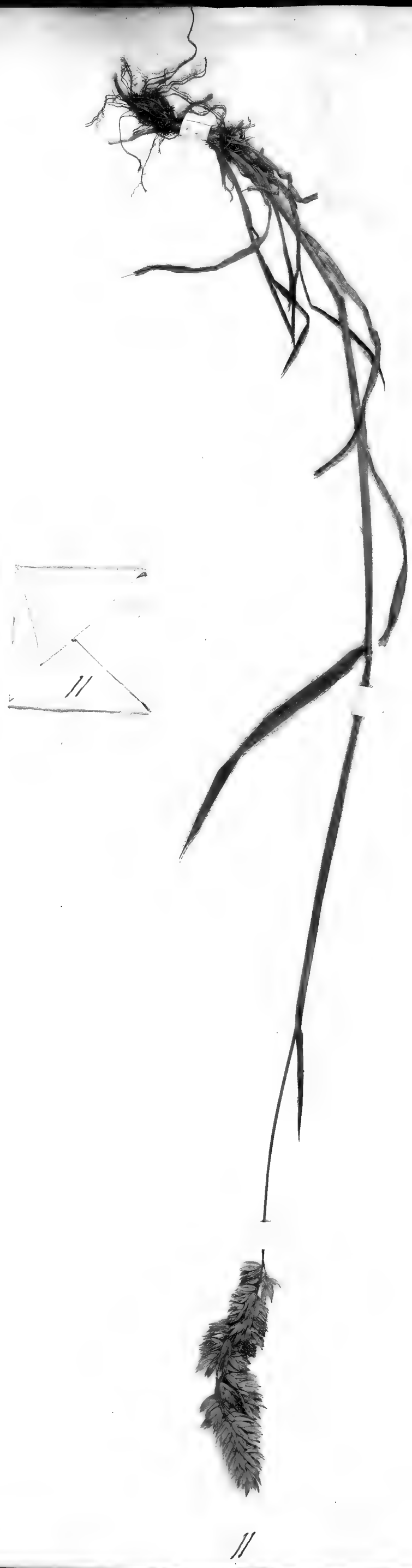

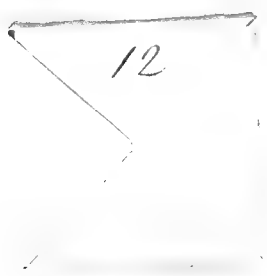
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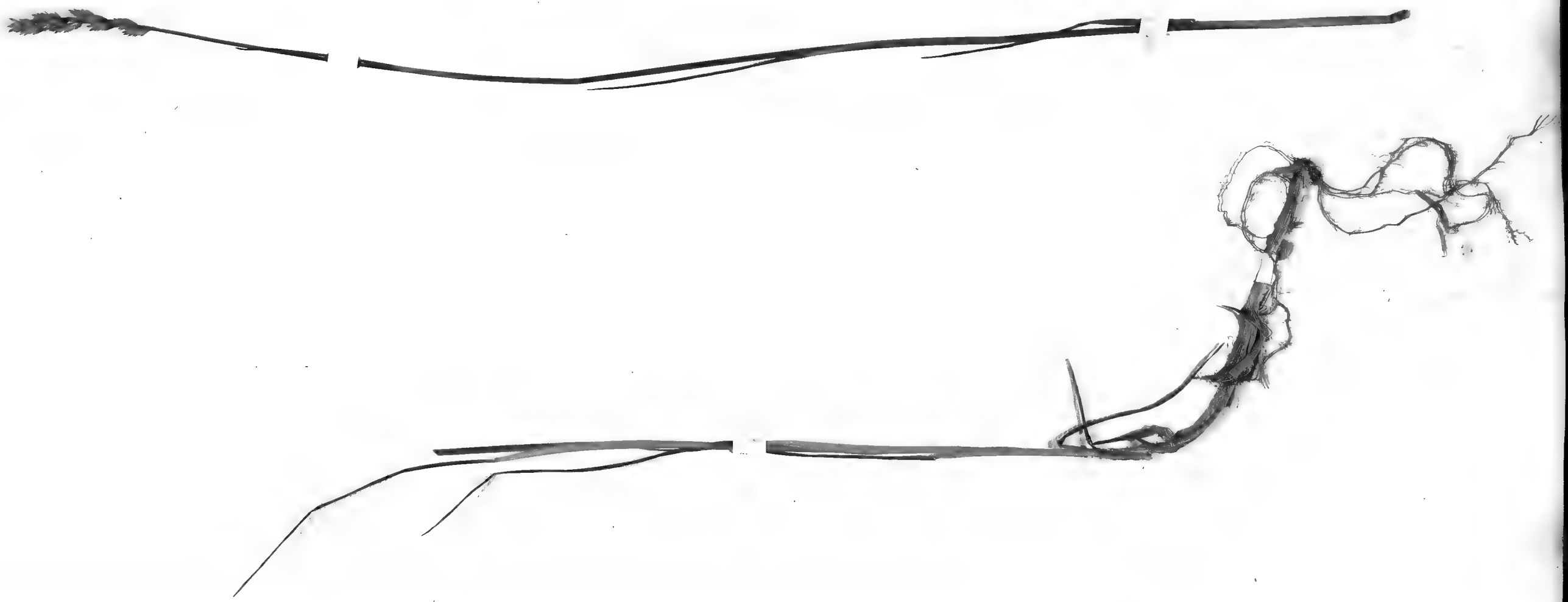

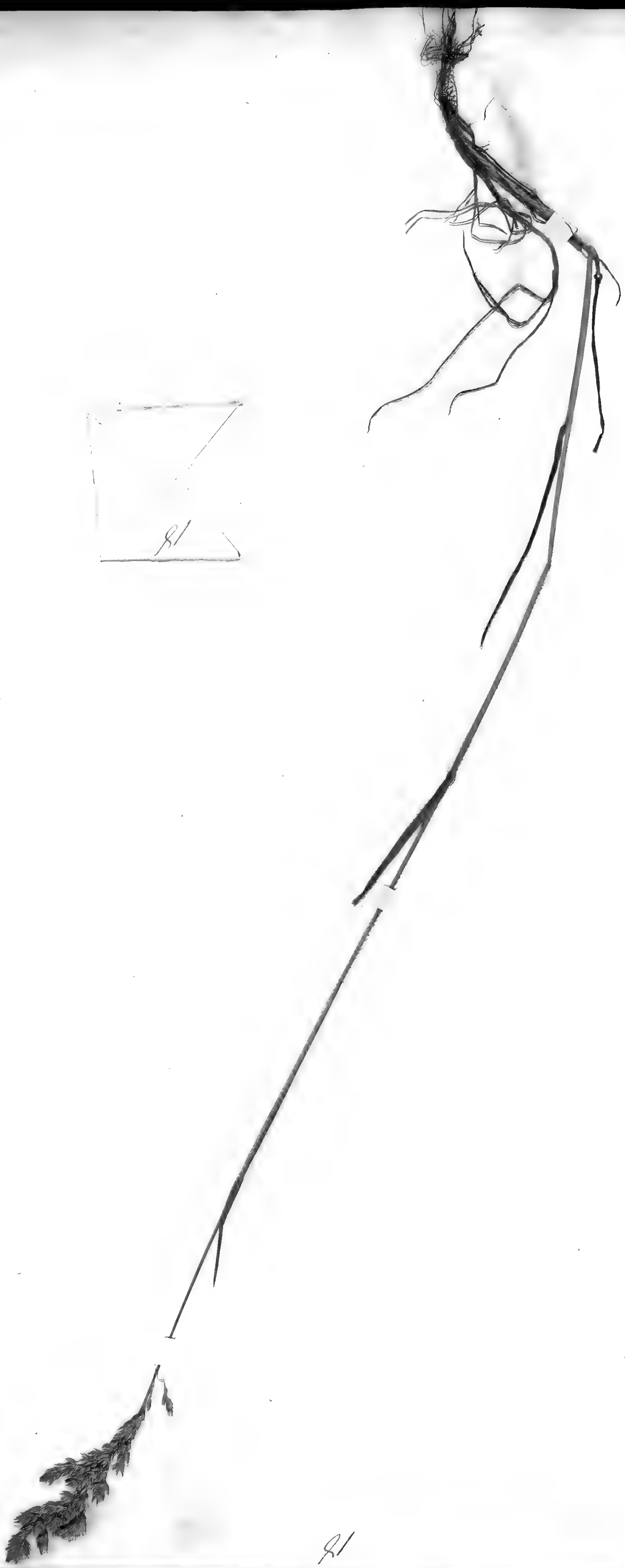


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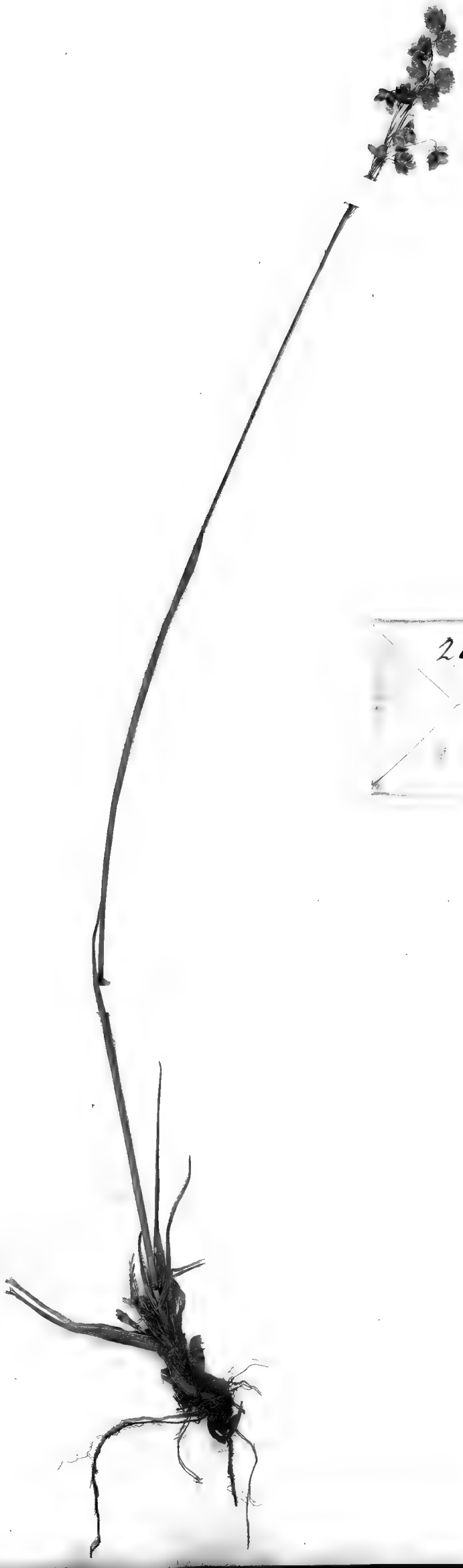

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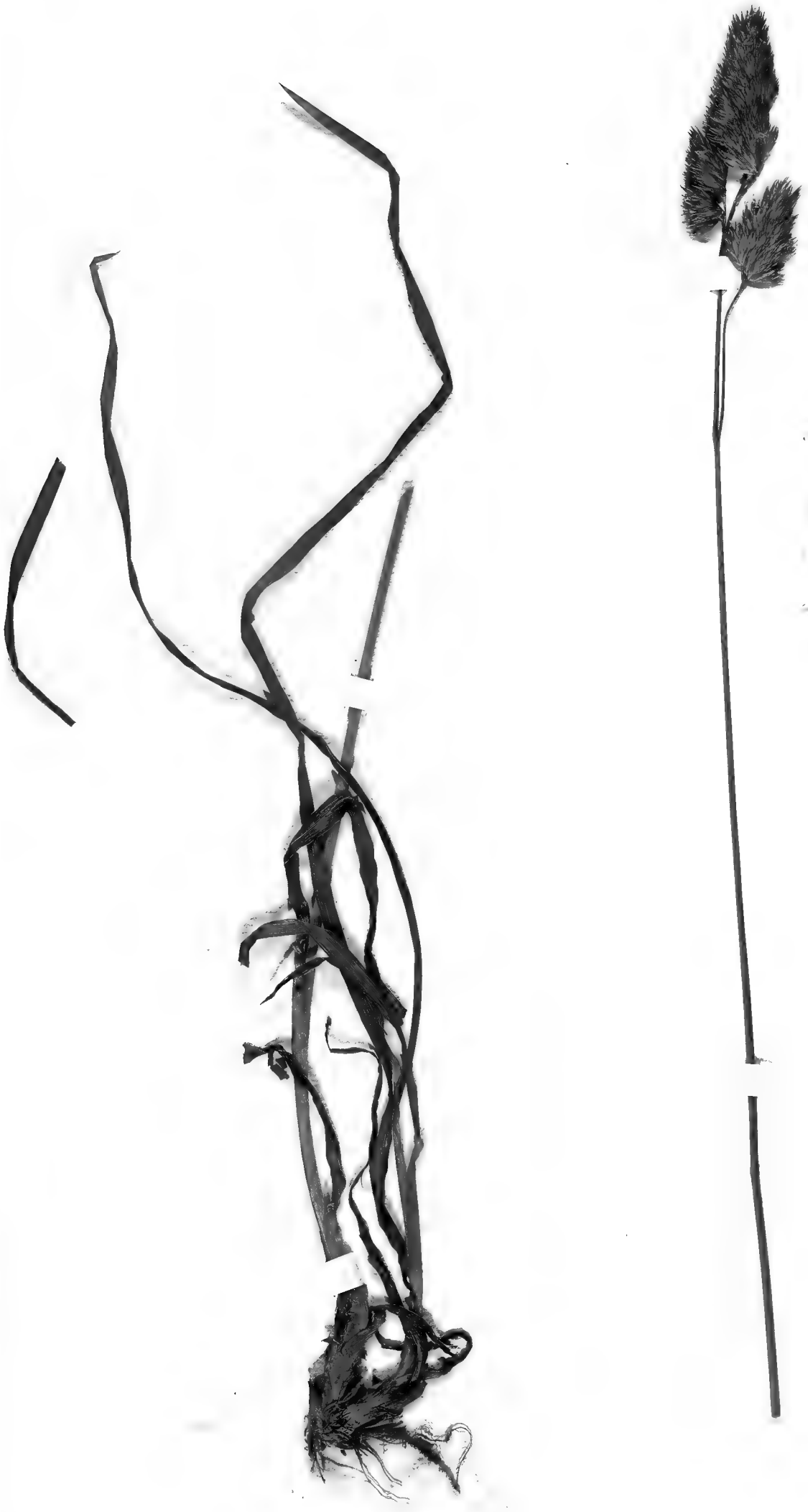

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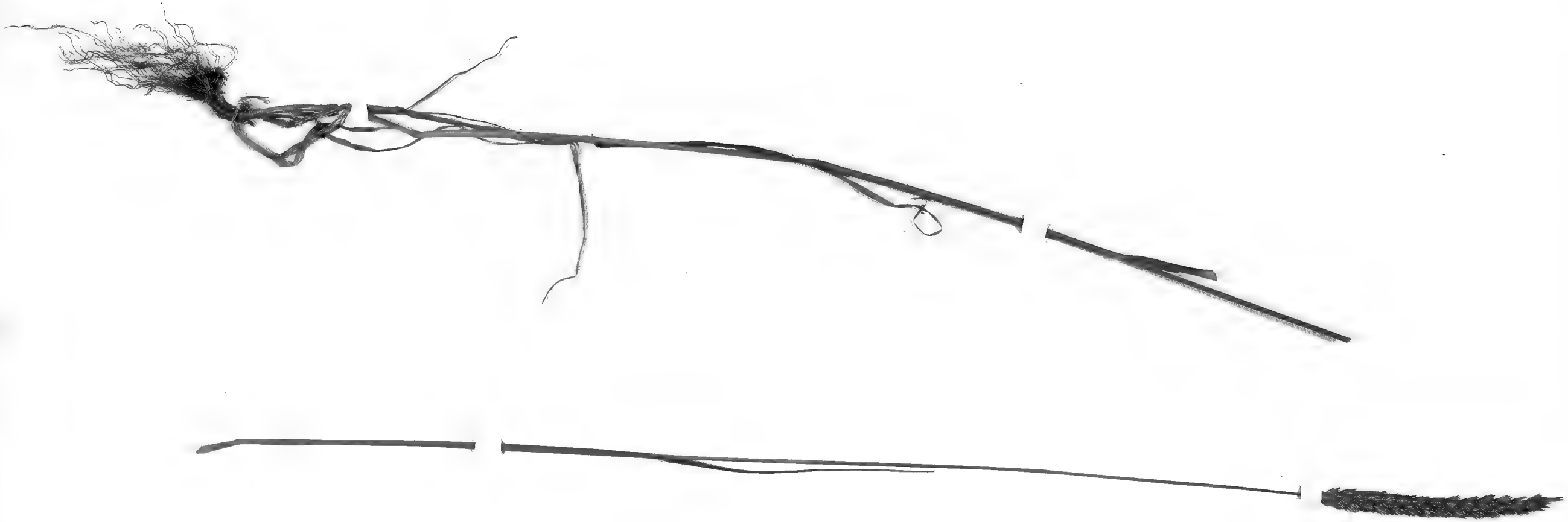

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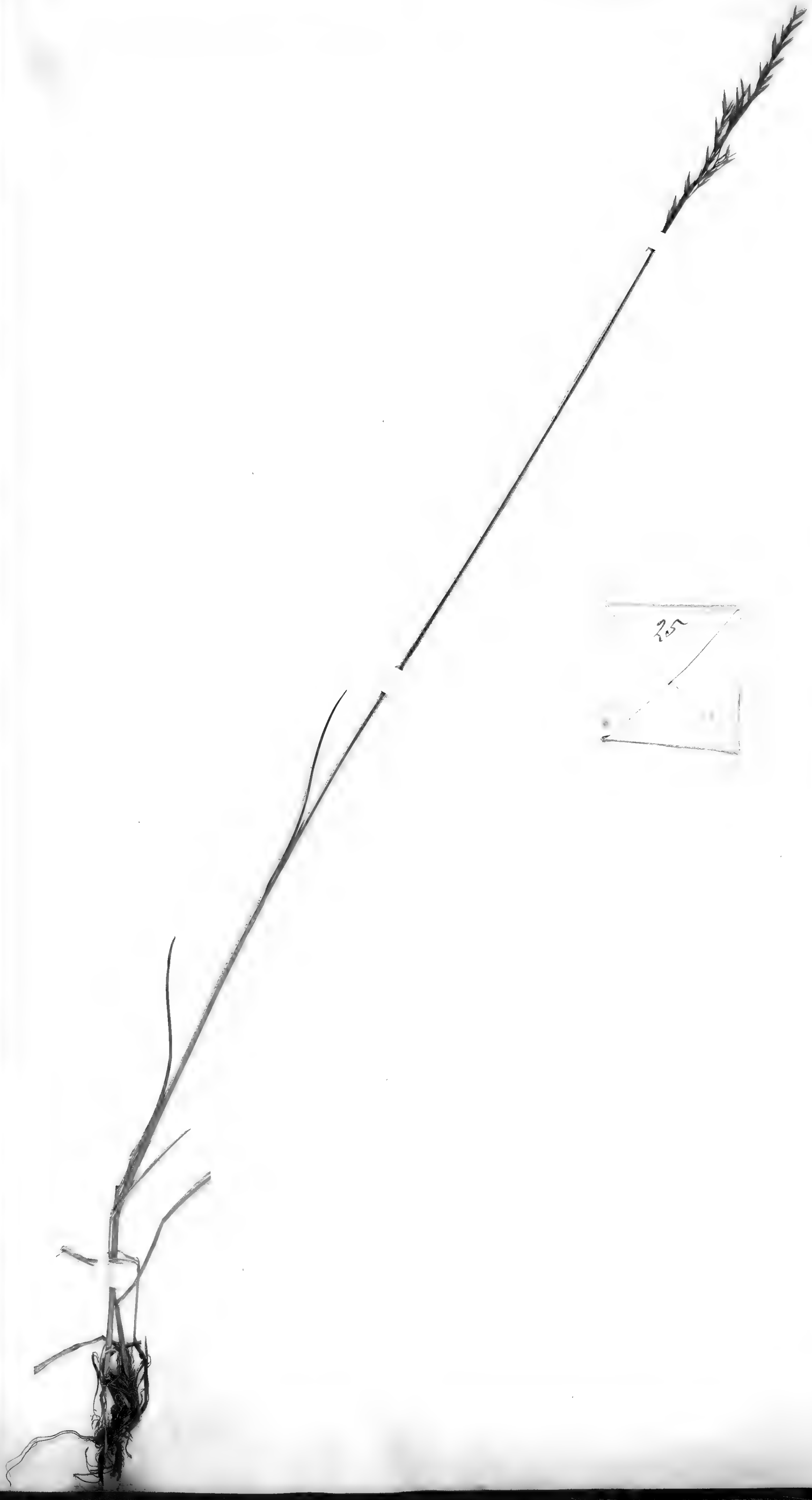

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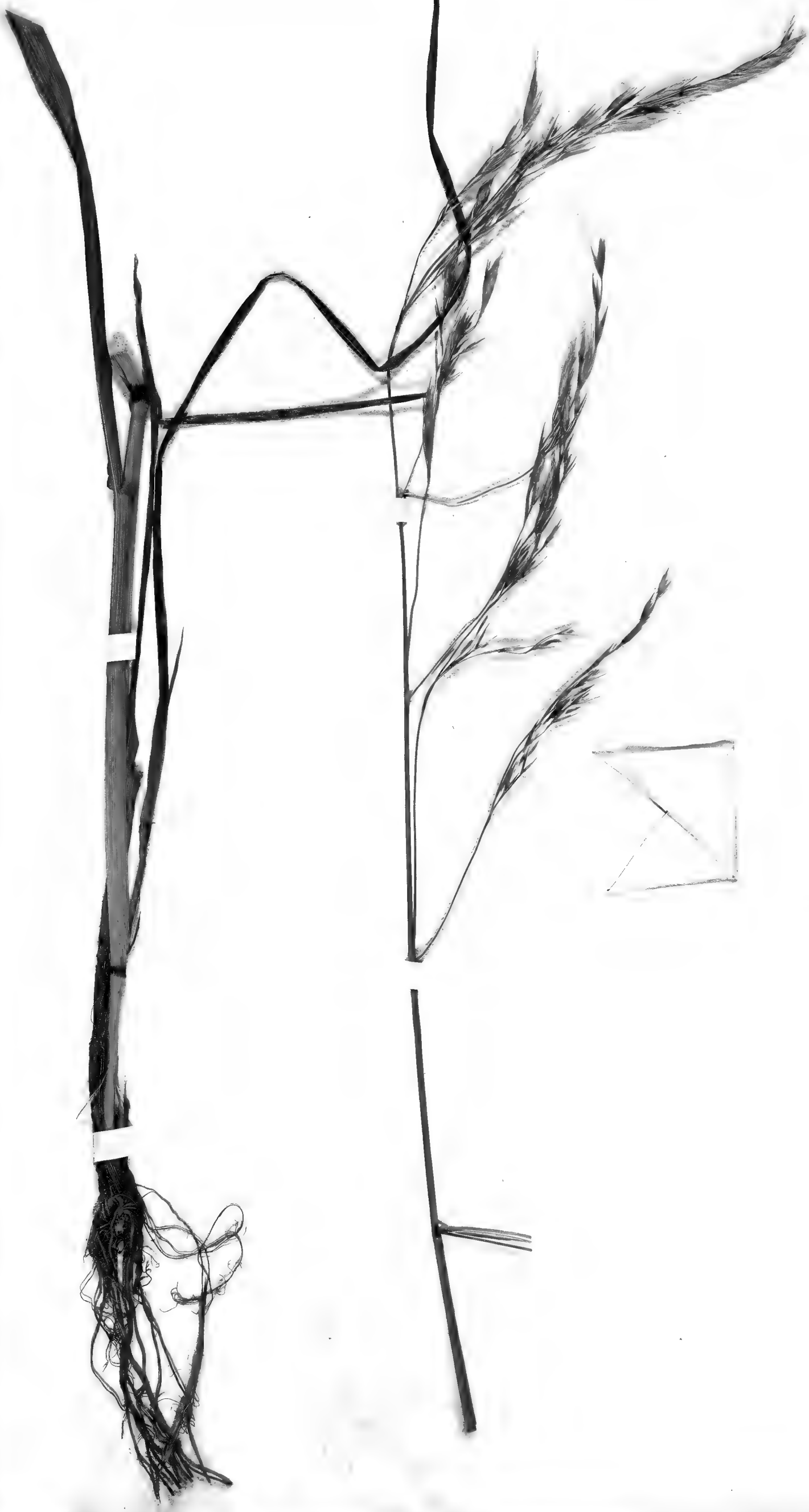

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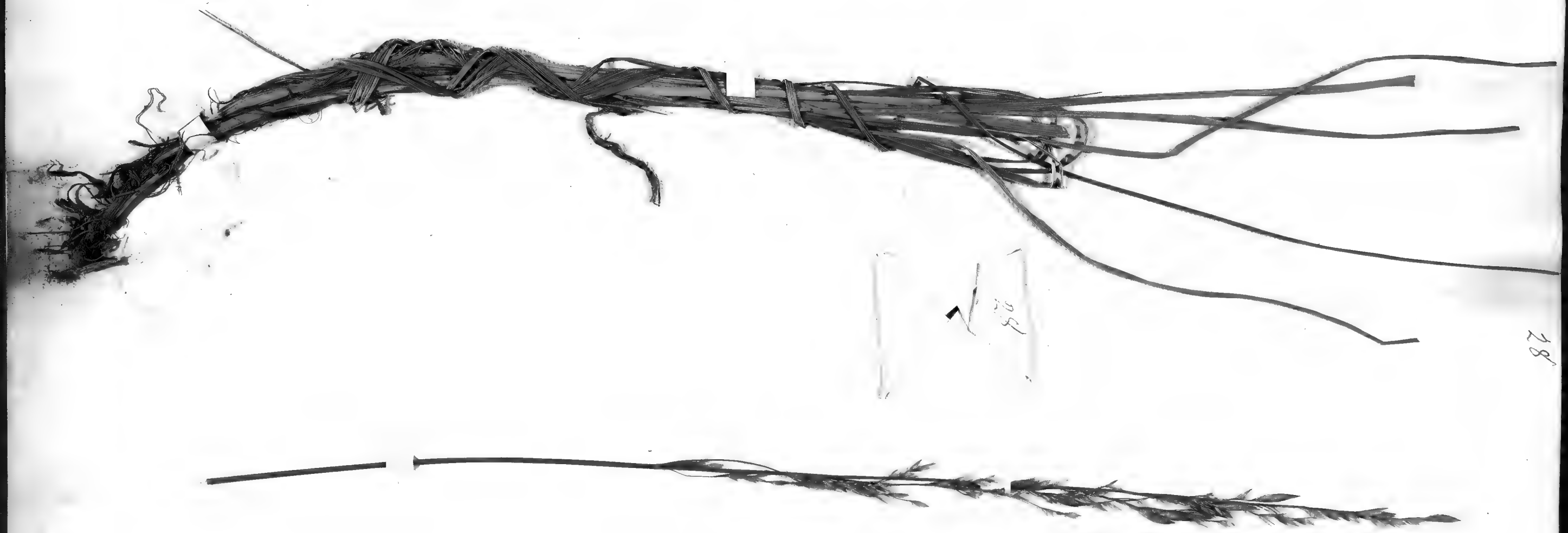


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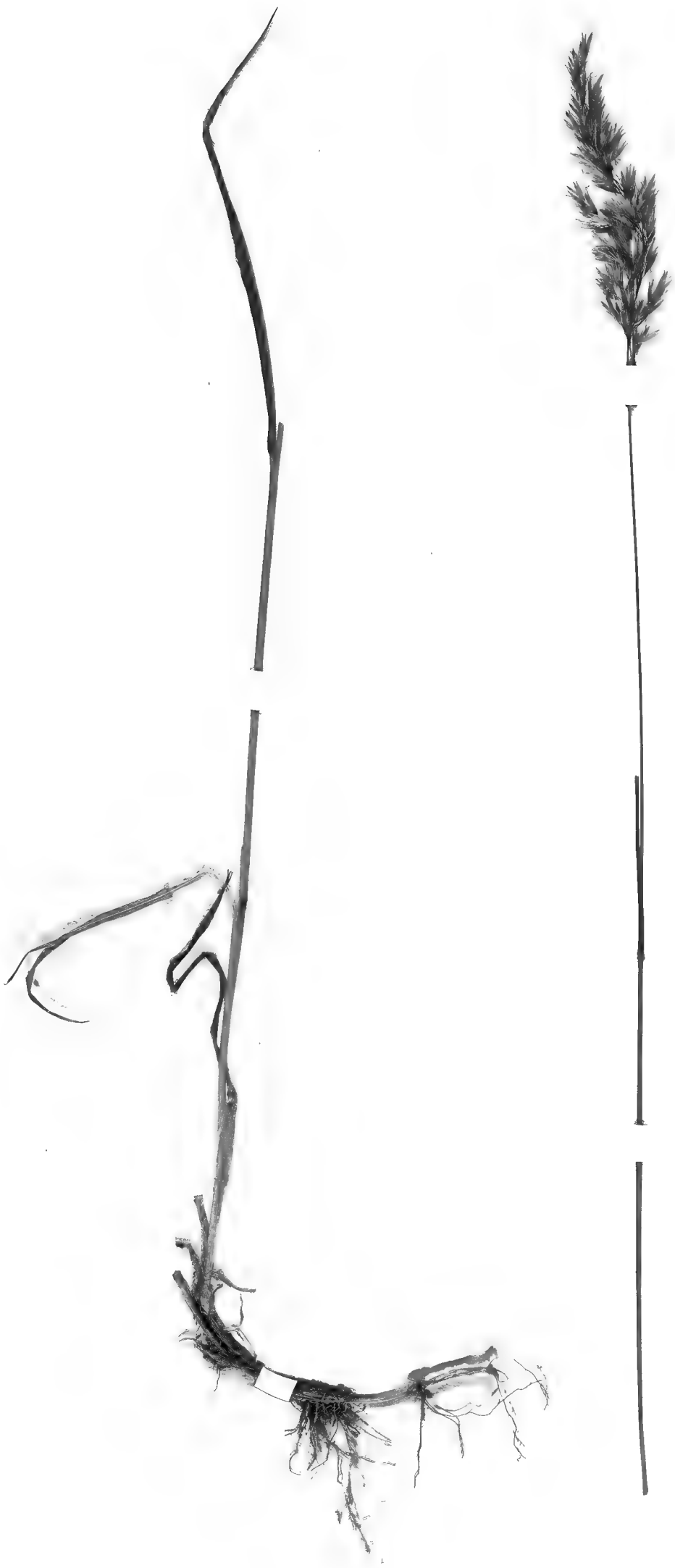

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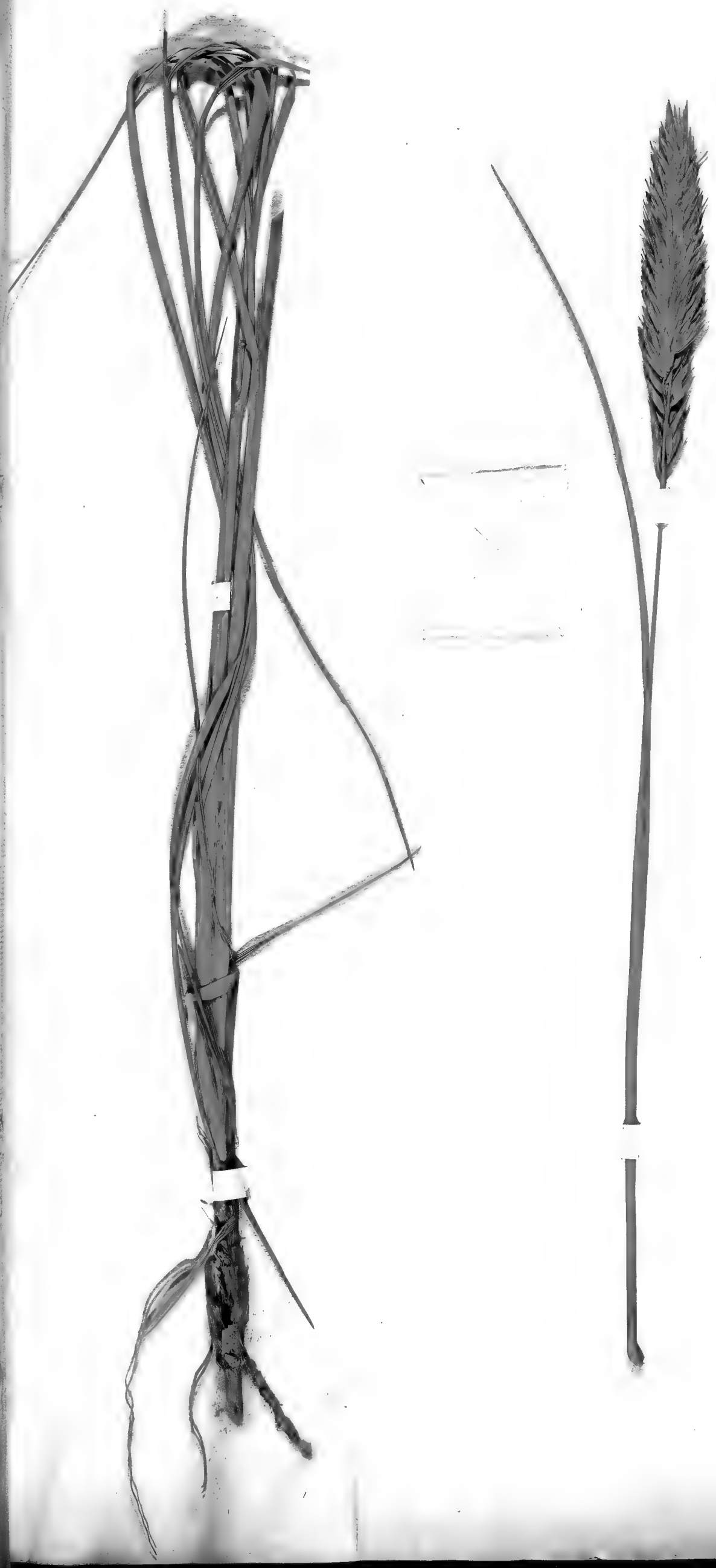

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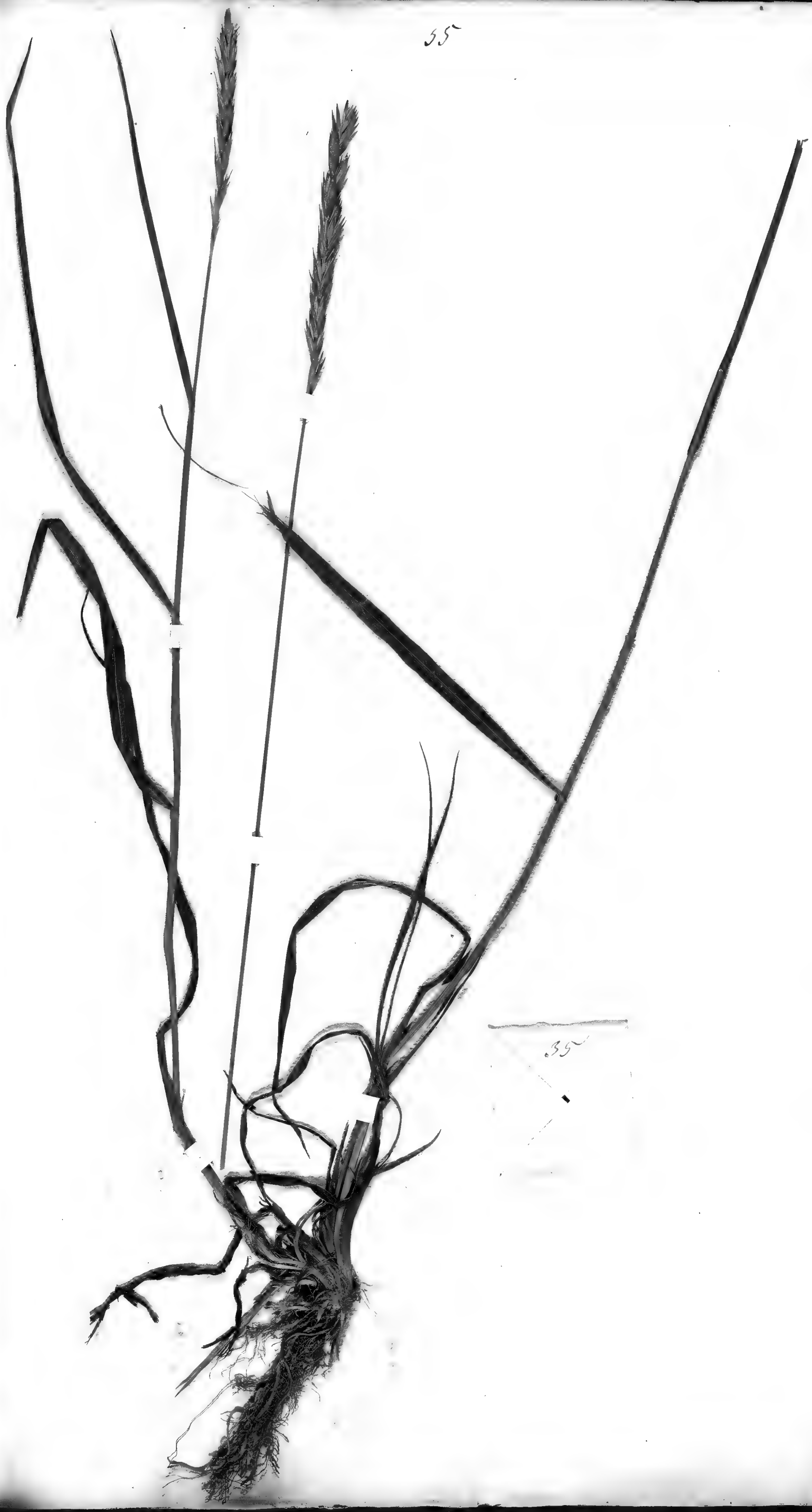
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Original specimens & seeds.