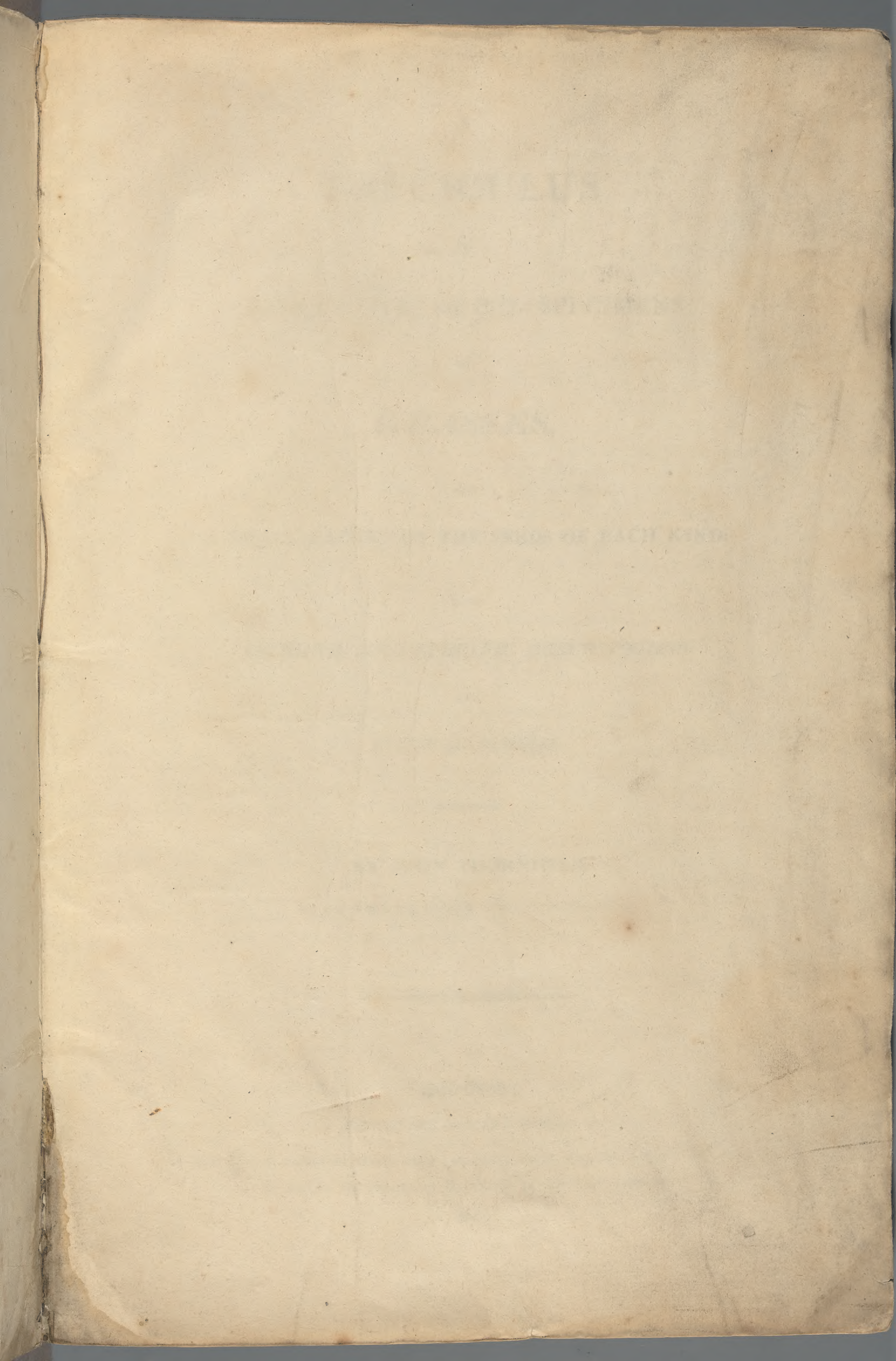

A FASCICULUS
OF 35 DRIED SPECIMENS OF
GRASSES,
AND A SMALL PACKET OF THE
SEEDS OF EACH KIND.

Price 15s.



Faint, illegible handwritten text, possibly bleed-through from the reverse side of the page.



1850

THE

OF

AND

OF

OF

OF

OF

OF

OF

A SM

G

OLD ALSO

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 :

PRINTED AND SOLD BY J. MARSHALL.

SOLD ALSO BY LONGMAN, HURST, REES, AND ORME, AND R. PHILLIPS, LONDON: AND MAY
BE HAD OF THE PRINCIPAL BOOKSELLERS IN TOWN AND COUNTRY.

1806.

I have arranged the Grasses in my work according to the Linnaean system, after Professor Smith's Flora Britannica; from which my generic descriptions are mostly taken. I acknowledge the liberality of his 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 Plates of Seeds are from the plants themselves, which is all that is intended by giving them.

The Roman numerals distinguish the different Genera; the species are numbered from 1 to 20, to correspond with, and refer to, the plates of seeds, which are numbered in the same manner.

The technical terms used in the descriptions, are most of them, I think, to be explained in the following manner.

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 flap 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 *Festuca*.

B

II.

PHLEUM. Calyx, a two-valved glume or husk; valves truncated, pointed, fitting 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 flattened 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 Grass is agreeable to both cows and horses, the former seem very fond of it. I much fear that it would not grow out of water. Where meadows are subject to be overflowed, it would be well to sow its seeds, which it yields in profusion; if success attended the trial, the labour would be well bestowed, and richly repaid; for excellent food for cattle would be got on places where mostly plants of little value are produced. Such a trial might easily be made on a small scale.

8. *AIRA CÆSPITOSA*. *Turfy Hair Grass*. Root fibrous, strong; grows crowded in bundles. Straw three feet high, erect, with two joints and two leaves. Root leaves very long, narrow, and rigid; those on the straw short and narrow, also very harsh and strong; those of both root and straw rough on the upper surface and smooth beneath: radical ones sheathing and dilated at the base. Sheaths of the straw, cylindrical, smooth; lower one short, upper one long. Stipula, long, acute, split in two. Panicle sometimes a foot long, spreading; in exposed places brown and shining, in shady places white: principal branches in alternate half-whirls; secondary branches crowded, many-flowered. Calyx valves nearly equal in length, one rather broader than the other, both lance-shaped, keeled, and rough on the keel. Flowers one above the other. Valves of the corolla smooth, outer one broader than the inner, ragged at its top, with an awn fixed near its base; awn seldom longer than the valve. Seed, a very small oval grain.—Perennial, flowering in June and July.

Common, but most plentiful in moist grounds: a bad, harsh Grass, yet necessity sometimes 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 seeds, (which it yields in profusion) it might very easily be destroyed; its roots not creeping, and growing in tufts, it is not difficult to dig it up.

9. *AIRA FLEXUOSA*. *Zig-zag Mountain Hair Grass*. Root composed of strong, sometimes downy, fibres; very little branched. Straw, one to two feet high, with one joint at the base, and another a little above; naked on the upper part, and very smooth. Root leaves in bundles, commonly four issuing from a short brown membranous sheath, bristle-shaped, small, seldom exceeding two inches in length. Sheaths on the straw two, (each terminated by a short slender leaf,) cylindrical, striated, smooth; lower sheath 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, spreading, foot stalks zig-zag and rough. Flowers erect, pale purple, with a silvery gloss. Calyx valves nearly equal, lance-shaped, keeled, smooth, often ragged at their points. Corolla, valves unequal, bases hairy, outer convex, with an awn near its base; inner one rather concave, membranous, without an awn.—Seed, a small oval grain.—Perennial, flowers from June to August.

Common in high pastures. A tolerably good Grass for sheep; but hardly deserves cultivation.

10. *AIRA CARYOPHYLLEA*. *Silver Hair Grass*. Root fibrous, very small. Straw often branched near its base, small; joints commonly three. Root leaves small, soon perishing; those of the straw small, continuing. Sheaths long in proportion to the size of the plant, striated, and a little inflated. Stipula, long and entire. Panicle, branches few, often terminating in threes, diverging. Flowers ovate, very pale purple, with a silvery hue. Calyx valves equal, slightly keeled, and a little rough. Corolla, outer valve larger than the inner, convex, with an awn fixed a little above its base; inner valve slightly concave, without an awn; texture of both singularly hard, and rough on their outsides. Seed, a very small transparent grain.—Annual; flowering in June.

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

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 fitting, 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 feed 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 CÆRULEA.* *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 bracts, 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 feeds 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 flow-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 spike. 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 bractes, or floral leaves, at the base of each pair; winged, with two alternate rows of narrow leaflets, 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 fitting 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 caused me to think it worthy of being withdrawn from its retirement; but, on trial, although it is sweet, I find it is too tough to be nutritious. Cattle eat it, I fear, from necessity, not choice. In the places where I have seen it most plentiful, *Juncus sylvaticus*, Wood-rush, and *Bromus asper*, (Rough Bromie Grass), are its constant companions. Cattle choose it rather than either of its neighbours; but would certainly refuse it also, could they get better.

- 27 *FESTUCA PRATENSIS*. *Meadow Fescue Grass*. Root fibrous, strong, downy, and white. Straw commonly about two feet high, cylindrical, leafy below, naked above: joints about three, swollen, and crooked; one at the base, the next one inch above, and the third about four inches above the second. Leaves, a fine light green, keeled, smooth, about three-eighths of an inch broad; lateral shoots a foot long, in sheathing bundles of four leaves each; lowest leaf on the straw about six inches long, uppermost about three. Sheaths cylindrical; on the lateral shoots and base of the straw short, the uppermost on the straw long. Stipula very short, white. Panicle bending, branches in pairs, one longer than the other, on very short, compressed foot-stalks: alternate, at unequal distances, to near the top of the receptacle, where the flowers are fitting: rachis a half-cylinder, from the lowest to the third pair of branches, sharply two-edged, above which it is flat on both sides. Calyx, inner valve green on its back, with three white nerves, slightly keeled, edges membranous, white, point blunt; outer valve less, green on its back, with one white nerve: edges white, membranous, point blunt. Flowers, about seven in each calyx. Corolla, valves nearly equal, outer convex, green, smooth at its base, rather rough, and five-nerved near its point, which is mostly 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 side, and deeply grooved on the other.—Perennial: June to August.

Grows in the meadows near Gateshead, but sparingly: seems worthy the Agriculturist's notice, as it promises to yield much hay. Its profuse flowering renders it less desirable as an inhabitant of the pasture.

- 28 *FESTUCA ELATIOR*. *Tall Fescue Grass*. Root fibrous, fibres very downy, and strong; descending deep into the earth. Straw sometimes above six feet high, jointed, and leafy from its base to within ten inches of the panicle. Leaves on the lateral shoots, sometimes three feet long; on the straw one foot, half an inch broad at the base, ending in a sharp point; keeled, and smooth beneath, deeply striated on the upper side, and rough on the edges. Sheaths cylindrical, smooth; those on the lateral shoots, and lower part of the straw, short, those uppermost on the straw very long. Stipula green, short, and blunt. Panicle often above a foot long; lower part branched in pairs, foot-stalks compressed, and toothed on their edges, unequal in length, the pair at the base longest; those above successively shorter, until the flowers become fitting at the top of the rachis, where it is flat on both sides, and toothed on its edges: from the base to the third pair of branches it is a half-cylinder, with blunt, smooth edges. Calyx valves unequal, lance-shaped, sharp-pointed, slightly 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, scarce visibly nerved at its base; above it is five-nerved; the four lateral ones ceasing 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 resembles 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 side, and grooved on the other.—Perennial: June to August.

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 fitting 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 *Hofler'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 fitting 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 fits 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.

VI.

ARUNDO. Calyx, a husk of two valves. Corolla, a husk of two valves, furrowed 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 hulk of one valve, fixed close to the rachis; many flowered. Corolla, a hulk 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 flattened, 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 finely 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; spikelets alternate, fitting 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, spikelets 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, ^{awn} and 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.		
	<i>Feet.</i>	<i>In.</i>	<i>No.</i>	<i>No.</i>	<i>Feet.</i>	<i>In.</i>	<i>lb.</i>	<i>oz.</i>	<i>lb.</i>	<i>oz.</i>
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	4¼	0	2¾
8. Dactylis glomerata - - - -	1	4	1	120	1	6	0	14½	0	9¾
9. Cynofurus 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.

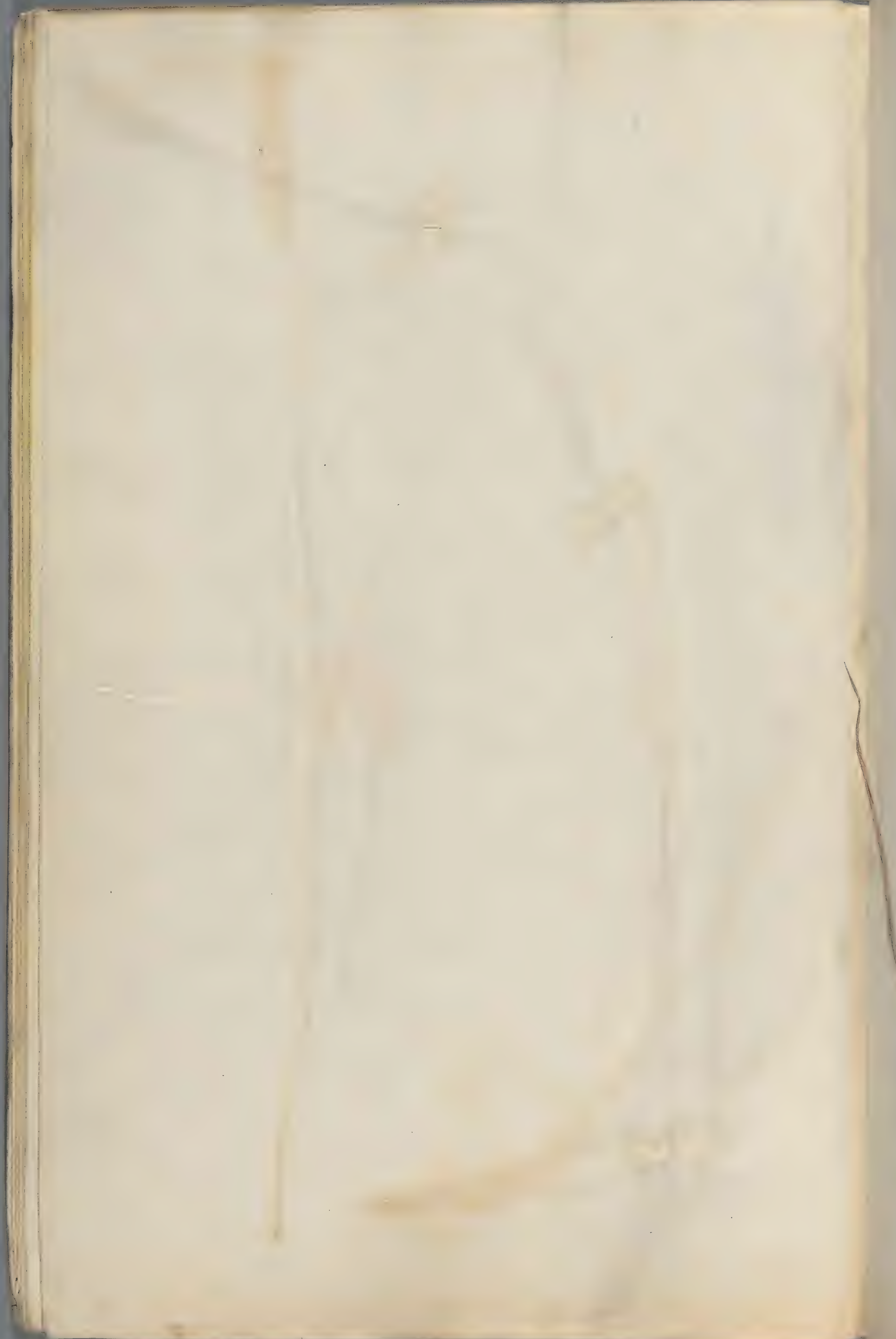
SUBSCRIBERS' NAMES.

- | | |
|--|---|
| <p>The Right Rev. the Lord Bishop of Landaff,
Calgarth-Park.</p> <p>Right Honourable Lord Howick, of Howick.</p> <p>Sir J. E. Swinburne, Bart. Capheaton.</p> <p>Mr. D. J. Ashworth.</p> <p>Charles William Bigge, Esq. Ellington-House.</p> <p>Thomas Bigge, Esq. London.</p> <p>Calverley Bewicke, Esq. Clofe-House.</p> <p>Mr. Thomas Bourn, Backworth.</p> <p>Mr. William Bates, Ryal.</p> <p>J. C. Curwen, Esq. M. P. Workington.</p> <p>Edward Charlton, Esq. Sandhoe.</p> <p>Mr. Robert Colling, Barmpton.</p> <p>Joseph Dunn, Esq. Saltwell-House.</p> <p>Mr. John Dodd, Hebburn.</p> <p>Cuthb. Ellison, Esq. Hebburn-Hall.—2 Copies.</p> <p>Rev. William Ellison, Lintz-Green.</p> <p>Mr. William Falla, Nurfery and Seedfman,
Gatehead.—2 Copies.</p> <p>Rev. R. H. Fronde.</p> <p>Mr. Thomas Fenwick, Dipton.</p> <p>Mr. William Foggitt, Gatehead-Fell.</p> <p>Mr. William Forbes, Gatehead.</p> <p>T. W. Greenwell, Esq. Ford, near Lanchefer.</p> <p>Mr. Grace, Gosforth.</p> <p>Mr. Ralph Green, Langley-Moor.</p> <p>Mr. William Gibbon, Jun. Gatehead.</p> <p>Miss Horsley, Bolam.</p> <p>Jasper Harrison, Esq. Whickham.</p> <p>John Hunter, Esq. Hermitage.—2 Copies.</p> <p>Thomas Haggerstone, Esq. Ellingham.</p> <p>W. J. Hooker, Esq. Norwich.</p> <p>R. S. Hawks, Esq. Hawk's-Nest.</p> <p>Thomas Harvey, Esq. Gatehead.</p> <p>Mr. J. A. Hunter, Nurfery and Seedfman,
Birmingham.</p> <p>Mr. Richard Hoyle, Paradise.</p> <p>Mr. Joseph Henderson, Gatehead-Fell.</p> | <p>Mr. Fairless Harrison, Gatehead.</p> <p>Mr. Thomas Jobling, Styford.</p> <p>John Kell, Claxtons.</p> <p>James Kirfop, Esq. Spital, near Hexham.</p> <p>Literary and Philosophical Society, Newcastle.</p> <p>George Liddell, Esq. Dockwray-Square.</p> <p>George Thos. Leaton, Esq. Whickham-House.</p> <p>Christopher Mafon, Esq. Chilton.</p> <p>Thomas Meggison, Esq. Whalton.</p> <p>Charles Millner, Esq. Offerton.</p> <p>Mr. Moor, Whitfield-Hall.</p> <p>J. D. Nefham, Esq. Houghton-le-Spring.</p> <p>Mr. William Nash, Seedsman, London.</p> <p>Mr. George Nelson, Newcastle.</p> <p>Mr. Anthony Nichol, Gatehead.</p> <p>Thomas Pattinson, Esq. Melmerby-Hall.</p> <p>Mr. William Robertson, Newcastle.</p> <p>Mr. Robson, Ravensworth.</p> <p>Mr. Henry Ridley, Ovington.</p> <p>Wm. Thos. Salvin, Esq. Croxdale.—4 Copies.</p> <p>R. Surtees, Esq. Mainsforth.</p> <p>William Scafe, Esq. Leafes.</p> <p>Mr. John Surtees, Surgeon, Medomfley.</p> <p>Mr. George Smith, Clofe-House.</p> <p>Mr. William Spencer, Gatehead.</p> <p>Dawson Turner, Esq. F. L. S. Yarmouth.</p> <p>Rev. William Turner, Newcastle.</p> <p>Mr. George Taylor, St. Helen's Auckland.</p> <p>Mr. William Taylor, St. Helen's Auckland.</p> <p>Mr. William Todd, Greenfide.</p> <p>R. B. Warwick, Esq. Warwick-Hall.</p> <p>Rev. Robert Whitehead, Ormside Lodge,
near Appleby.</p> <p>Rev. William Wilson, Rector of Wolfingham.</p> <p>Mr. John Warwick, Hop and Seed Merchant,
Southwark.</p> <p>Mr. Anthony Wailes, Houghton.</p> <p>Mr. Matthew Wheatley, High-Heworth.</p> |
|--|---|

TABLE OF CONTENTS

Introduction	1
Chapter I	10
Chapter II	25
Chapter III	40
Chapter IV	55
Chapter V	70
Chapter VI	85
Chapter VII	100
Chapter VIII	115
Chapter IX	130
Chapter X	145
Chapter XI	160
Chapter XII	175
Chapter XIII	190
Chapter XIV	205
Chapter XV	220
Chapter XVI	235
Chapter XVII	250
Chapter XVIII	265
Chapter XIX	280
Chapter XX	295
Chapter XXI	310
Chapter XXII	325
Chapter XXIII	340
Chapter XXIV	355
Chapter XXV	370
Chapter XXVI	385
Chapter XXVII	400
Chapter XXVIII	415
Chapter XXIX	430
Chapter XXX	445
Chapter XXXI	460
Chapter XXXII	475
Chapter XXXIII	490
Chapter XXXIV	505
Chapter XXXV	520
Chapter XXXVI	535
Chapter XXXVII	550
Chapter XXXVIII	565
Chapter XXXIX	580
Chapter XL	595
Chapter XLI	610
Chapter XLII	625
Chapter XLIII	640
Chapter XLIV	655
Chapter XLV	670
Chapter XLVI	685
Chapter XLVII	700
Chapter XLVIII	715
Chapter XLIX	730
Chapter L	745
Chapter LI	760
Chapter LII	775
Chapter LIII	790
Chapter LIV	805
Chapter LV	820
Chapter LVI	835
Chapter LVII	850
Chapter LVIII	865
Chapter LIX	880
Chapter LX	895
Chapter LXI	910
Chapter LXII	925
Chapter LXIII	940
Chapter LXIV	955
Chapter LXV	970
Chapter LXVI	985
Chapter LXVII	1000

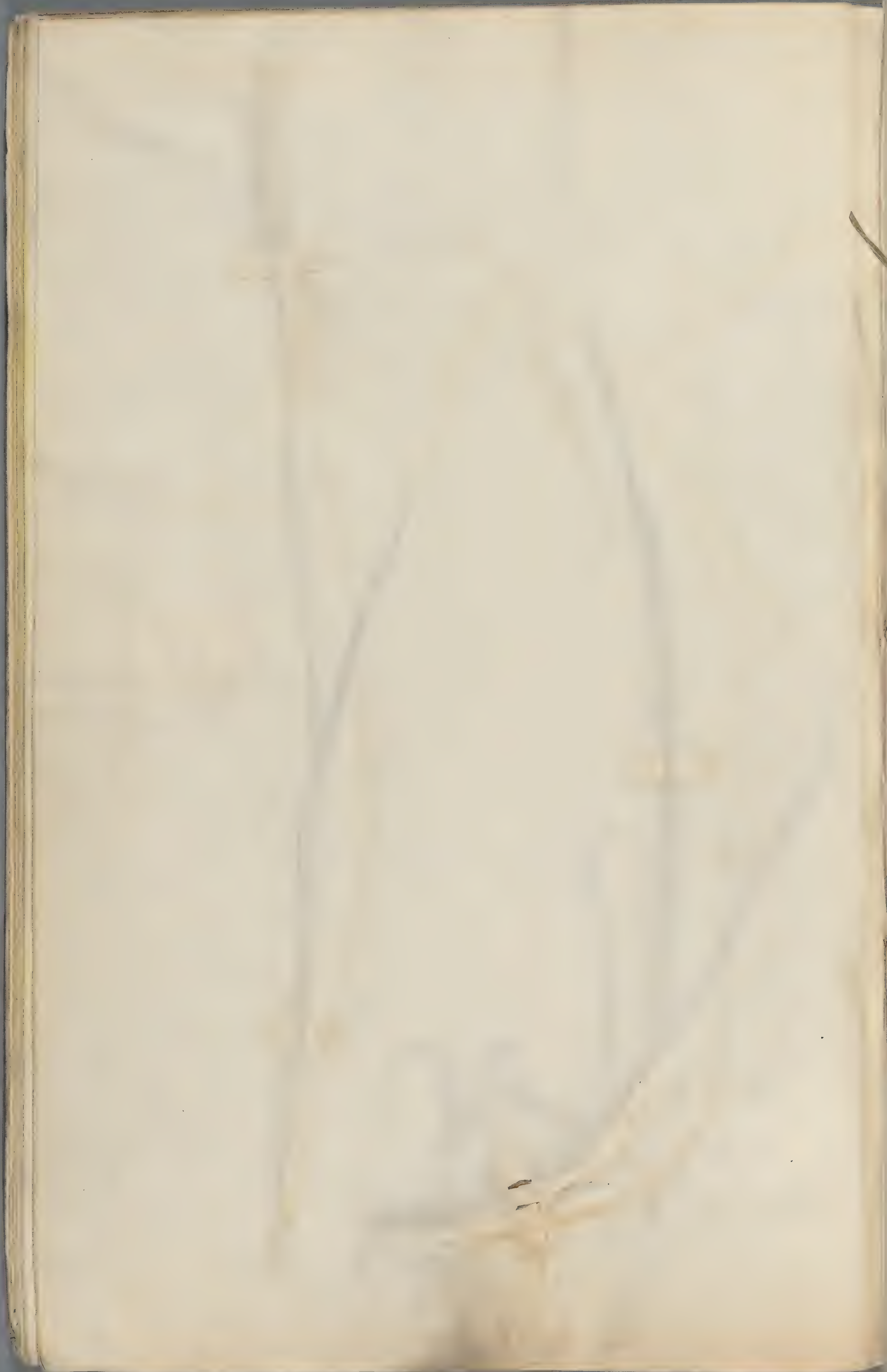


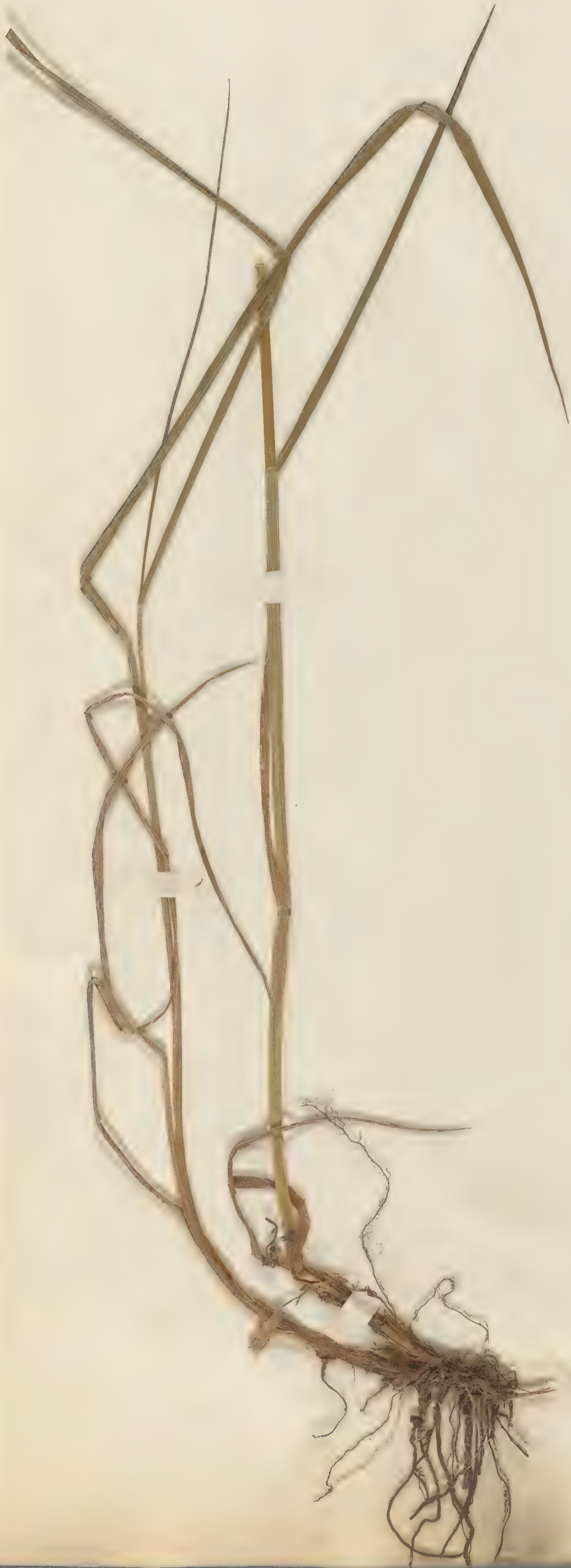


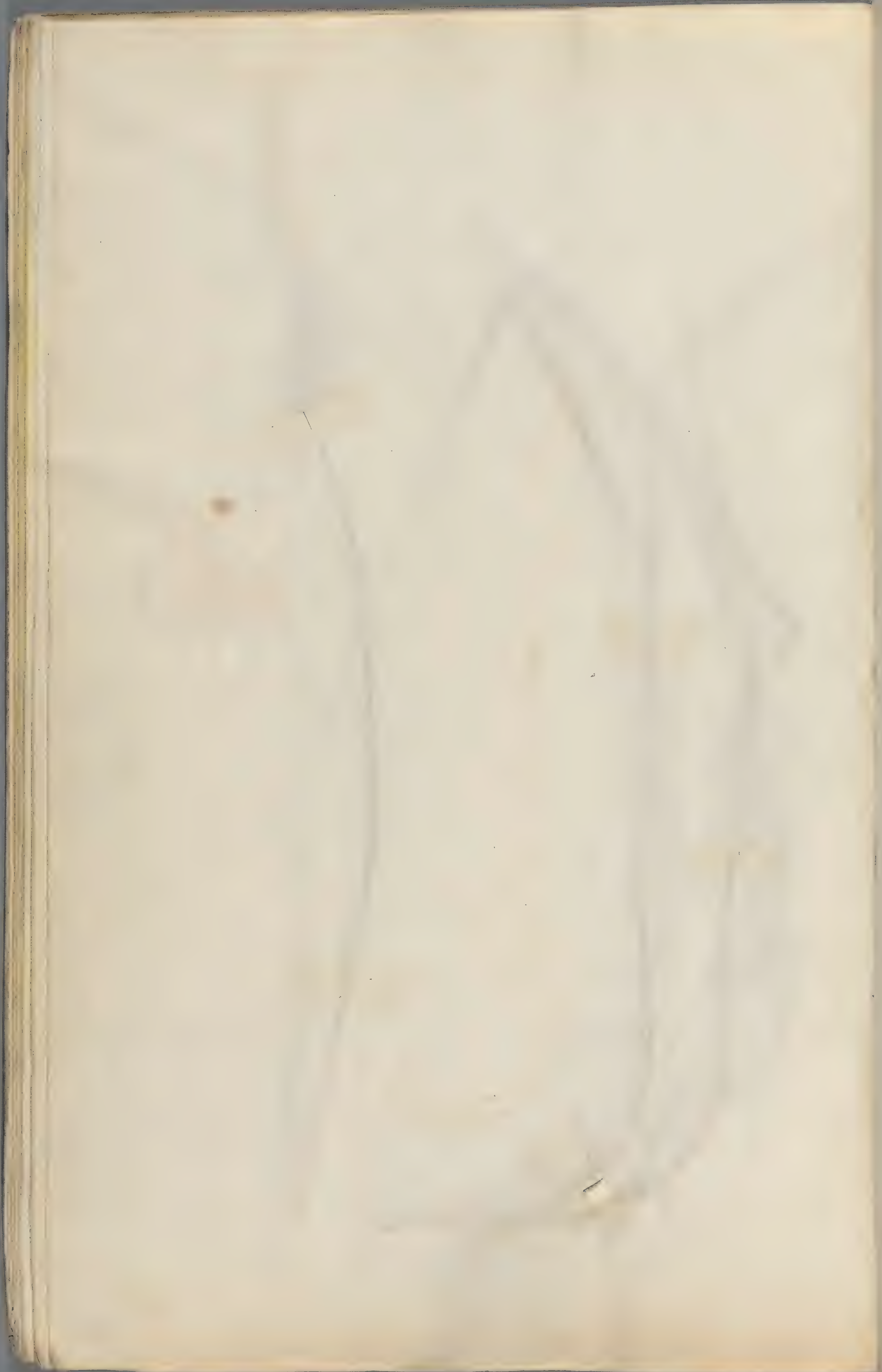
Handwritten text, possibly a botanical name or description, written vertically in a cursive script.



2

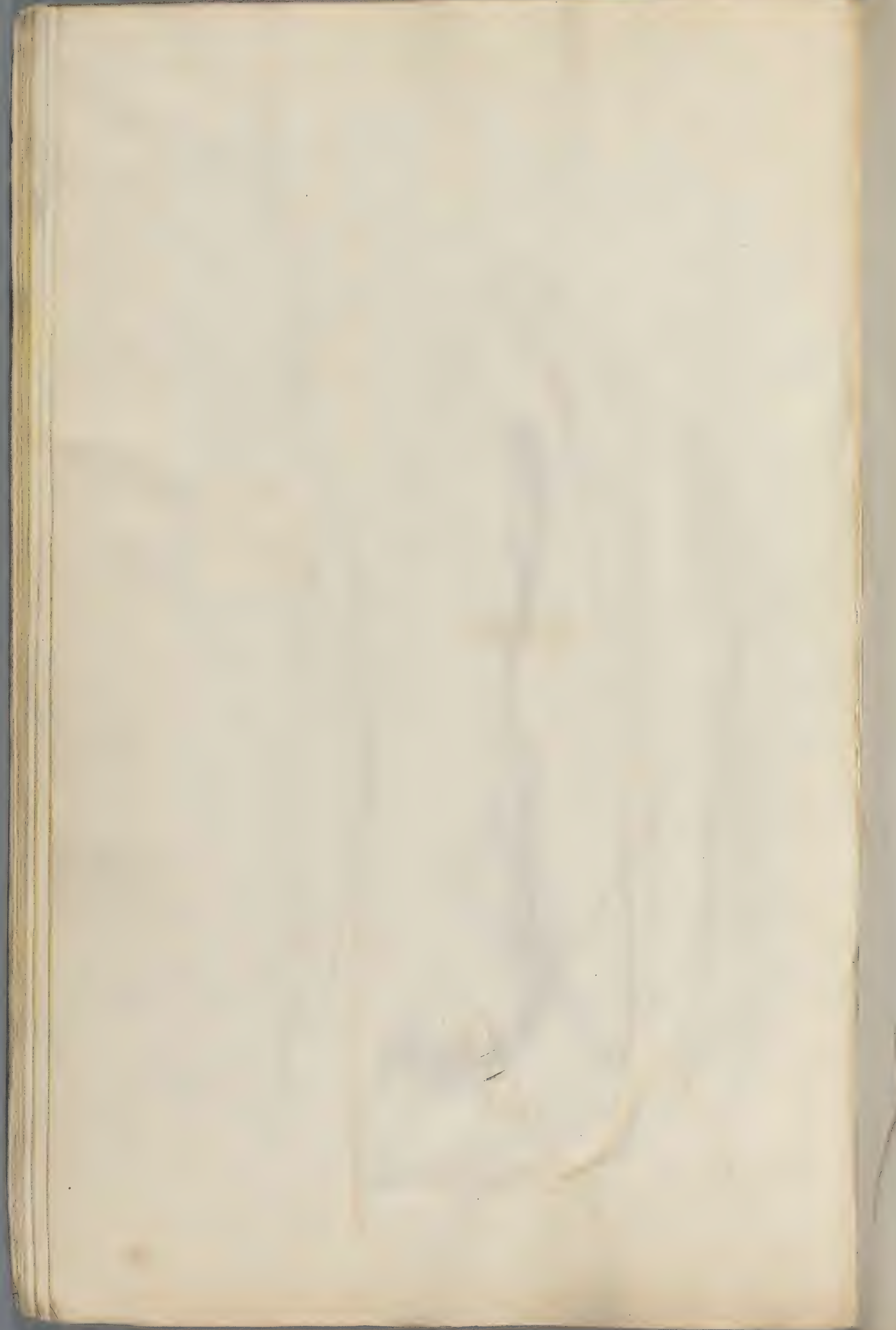


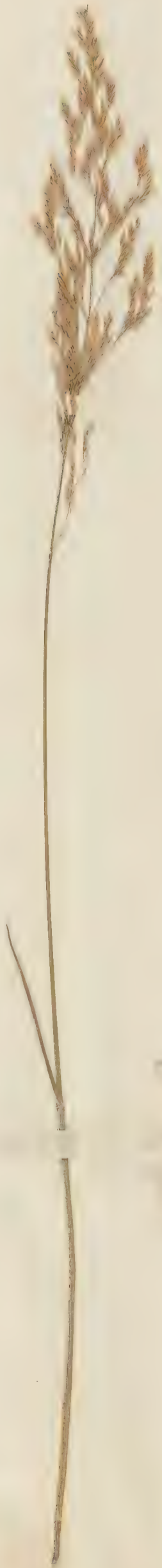


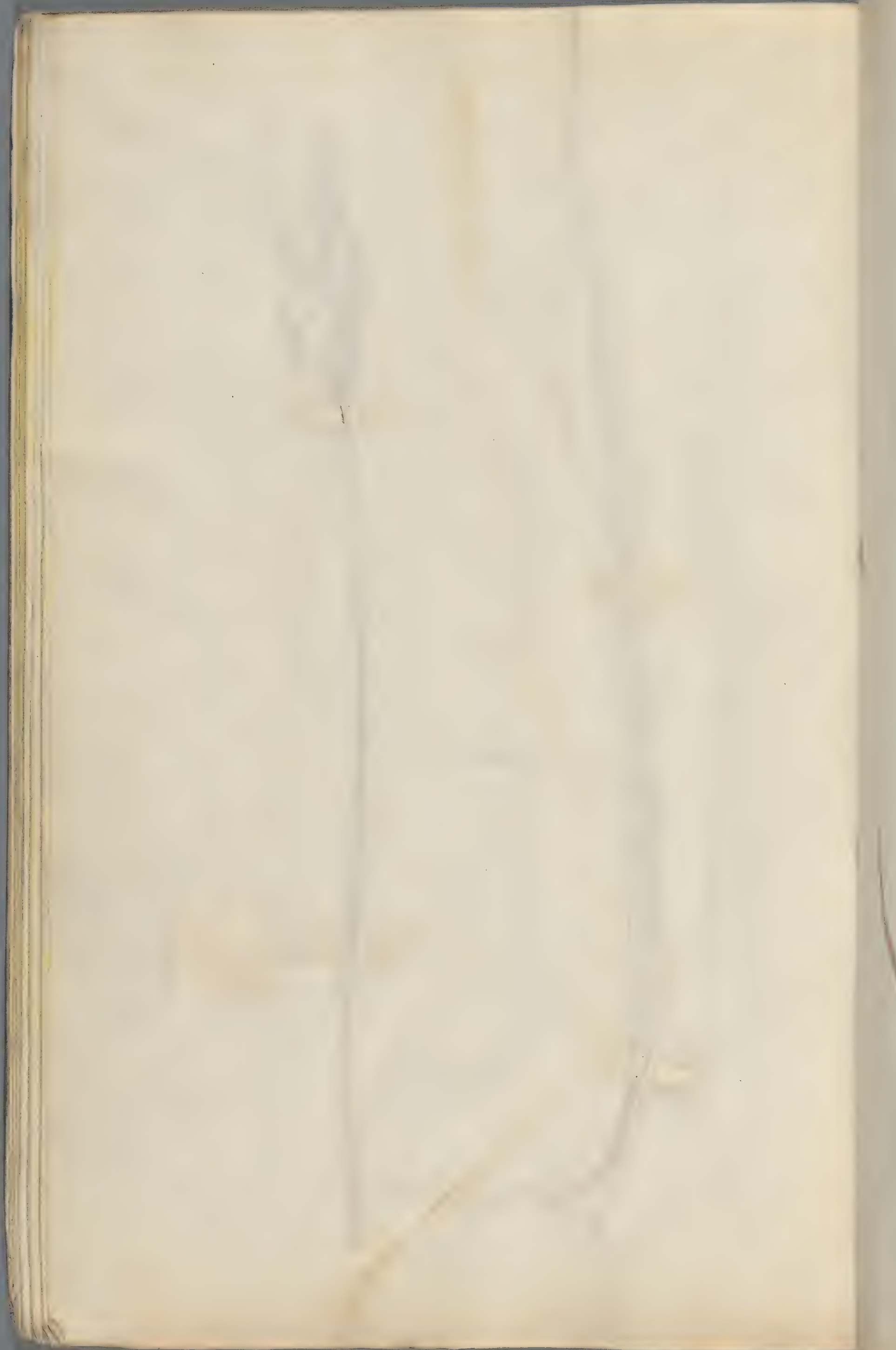


4



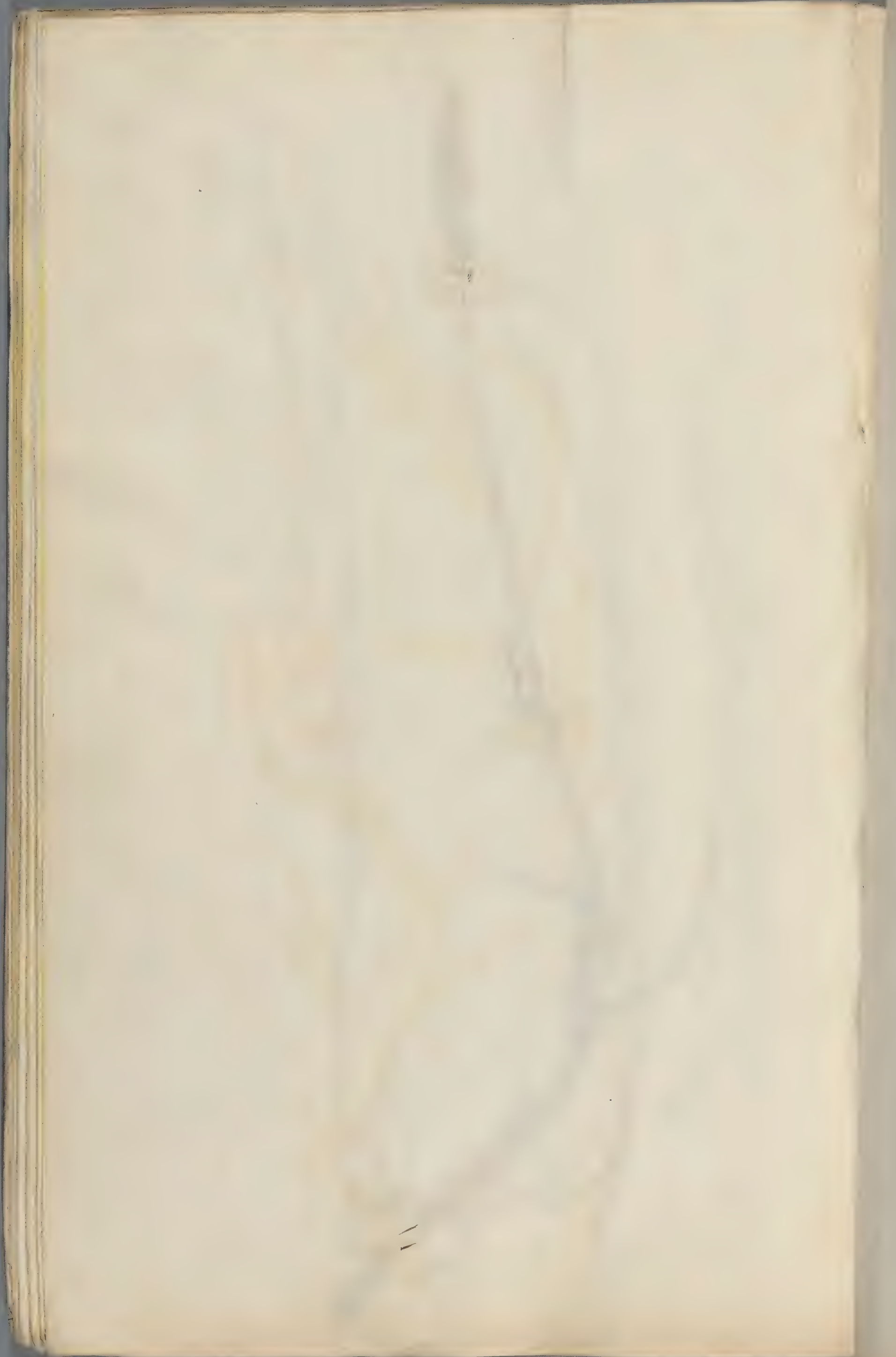




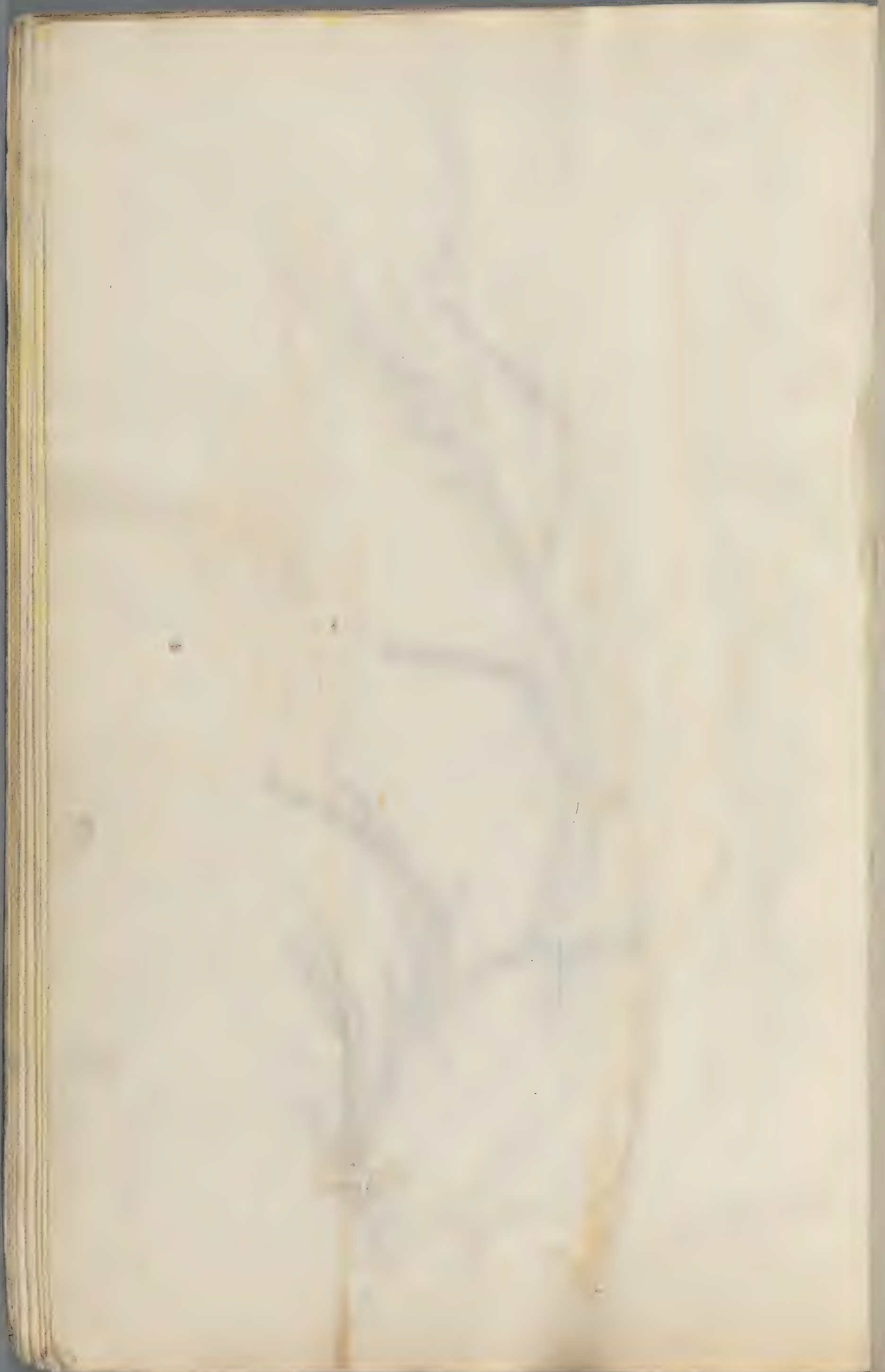


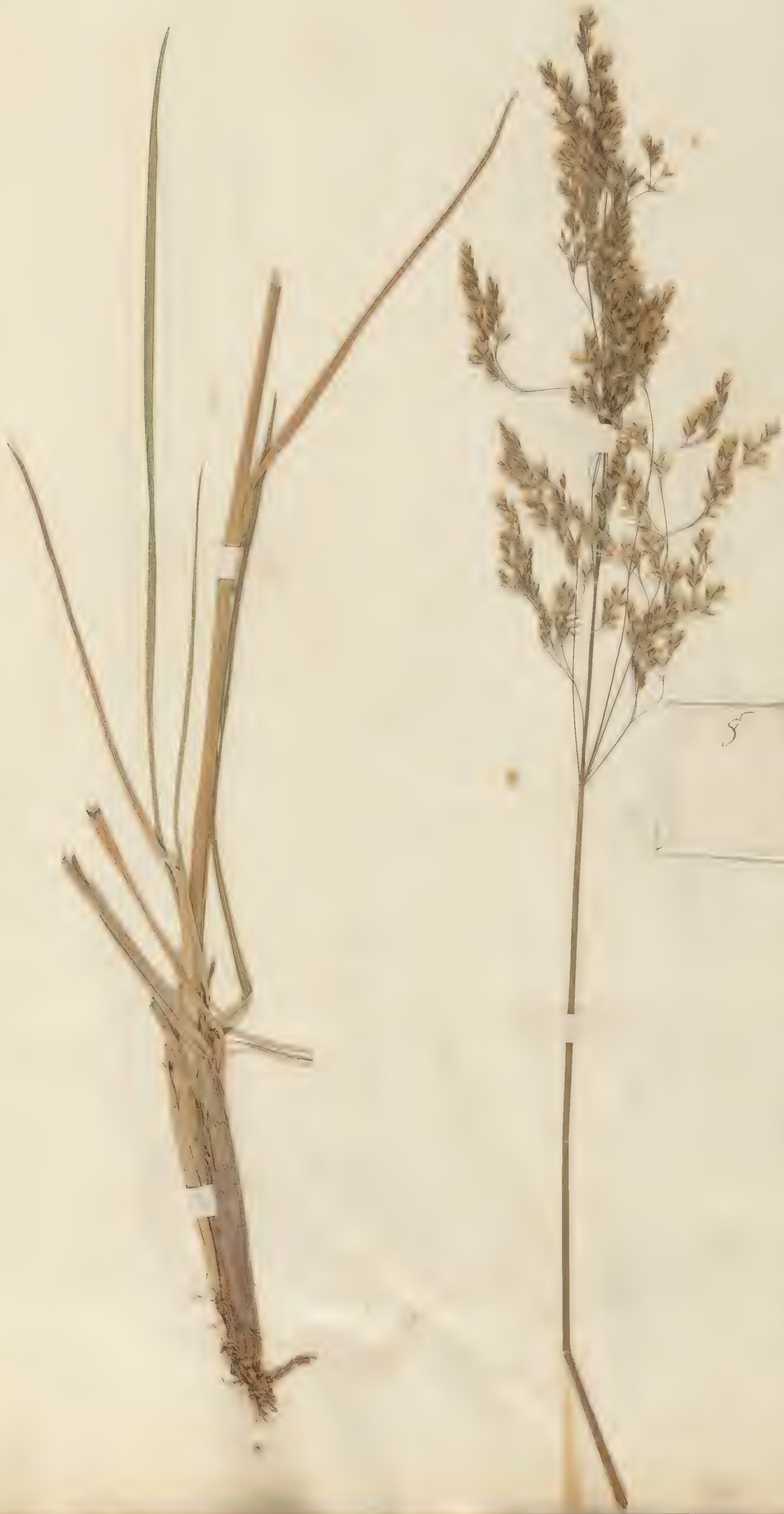


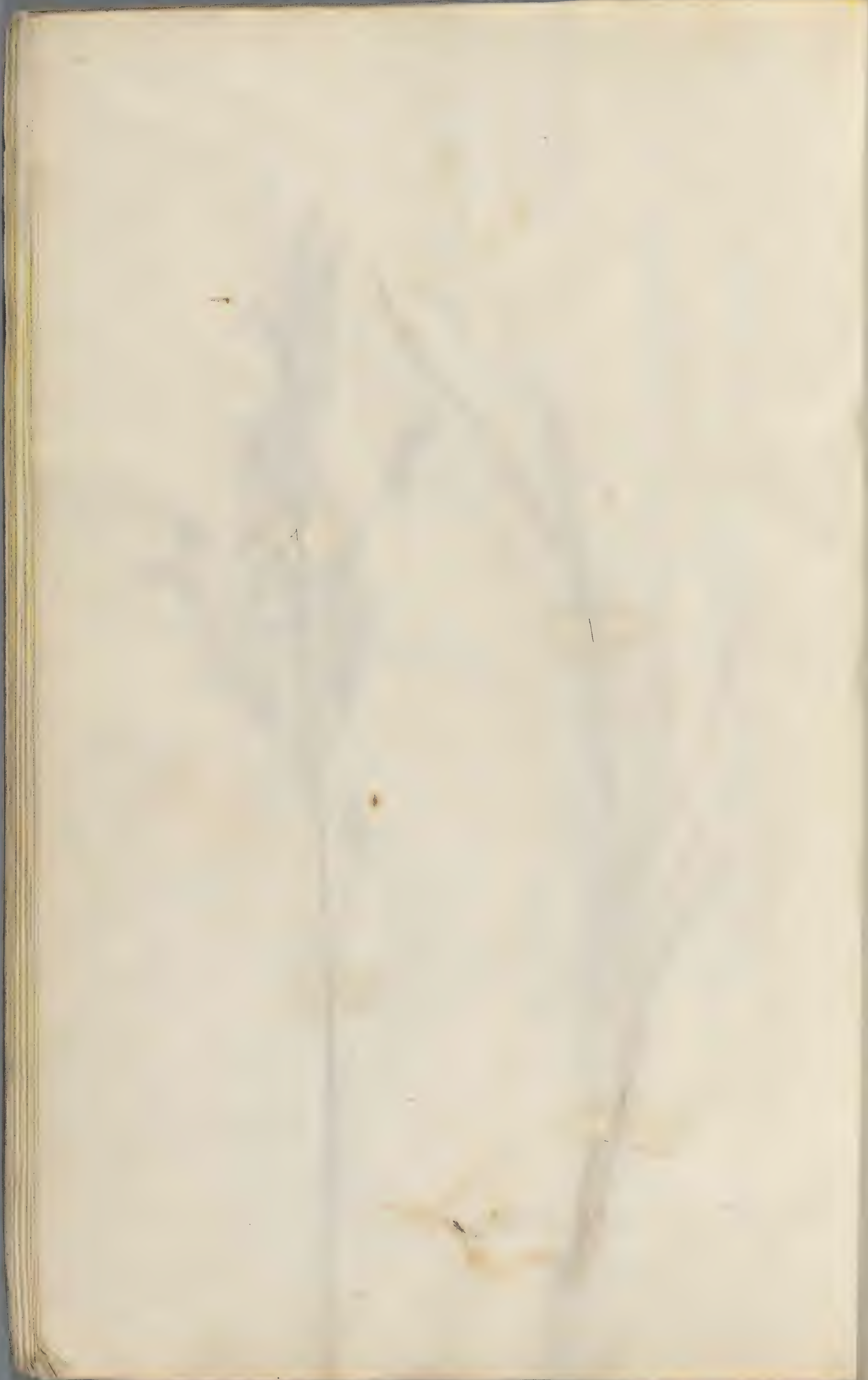
5





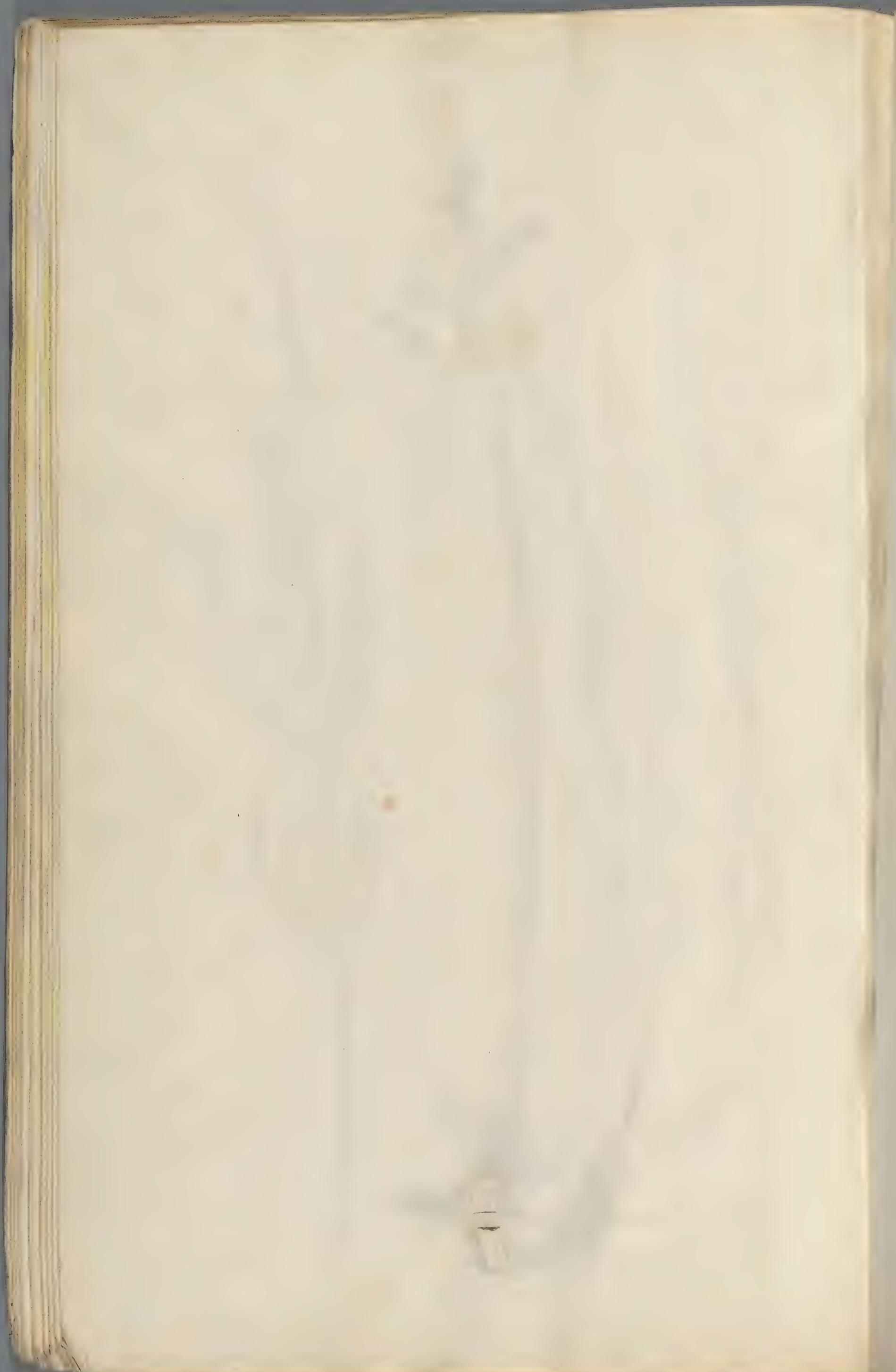


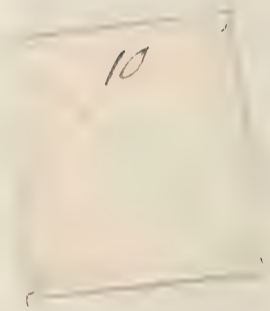


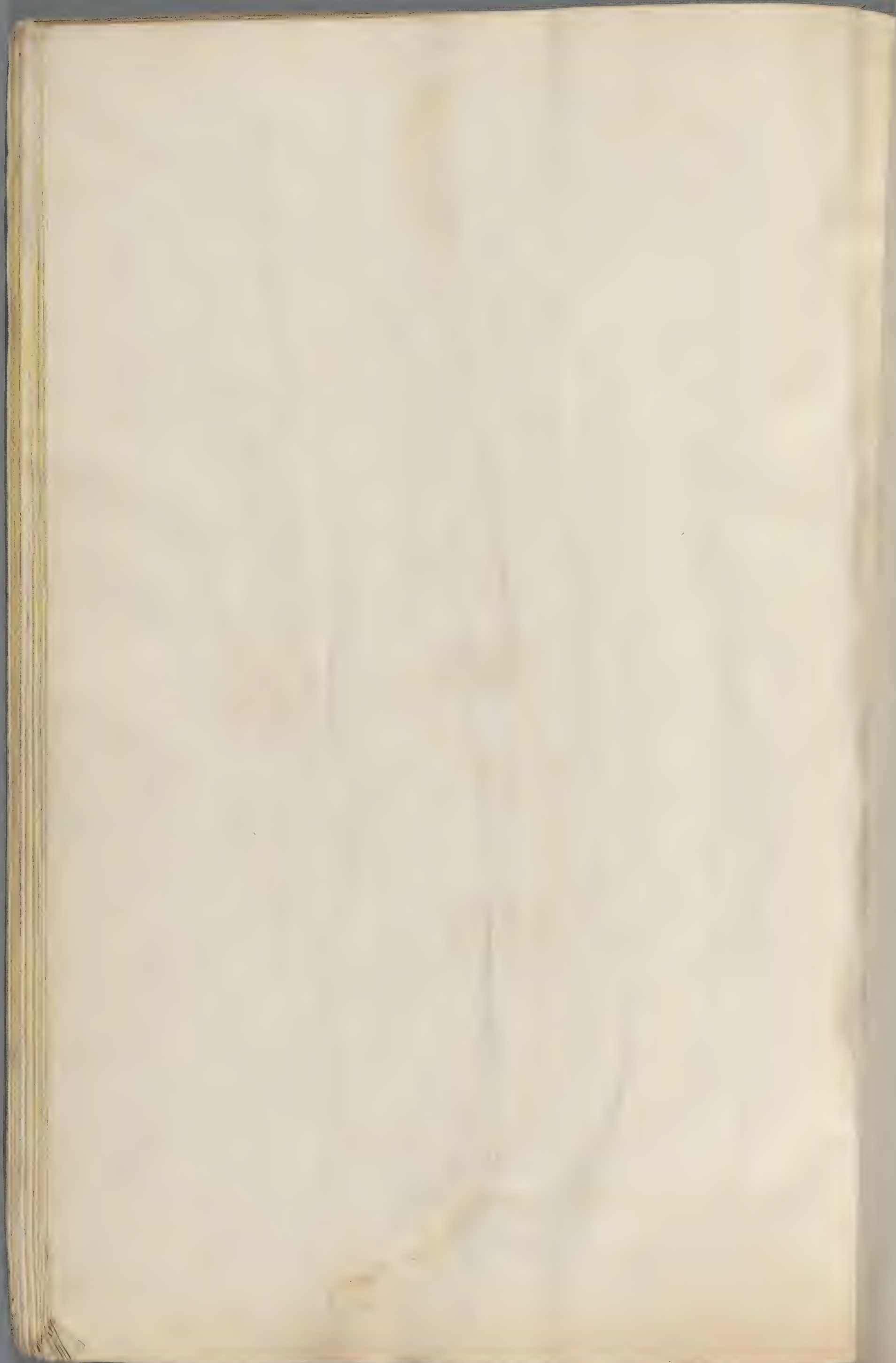


23



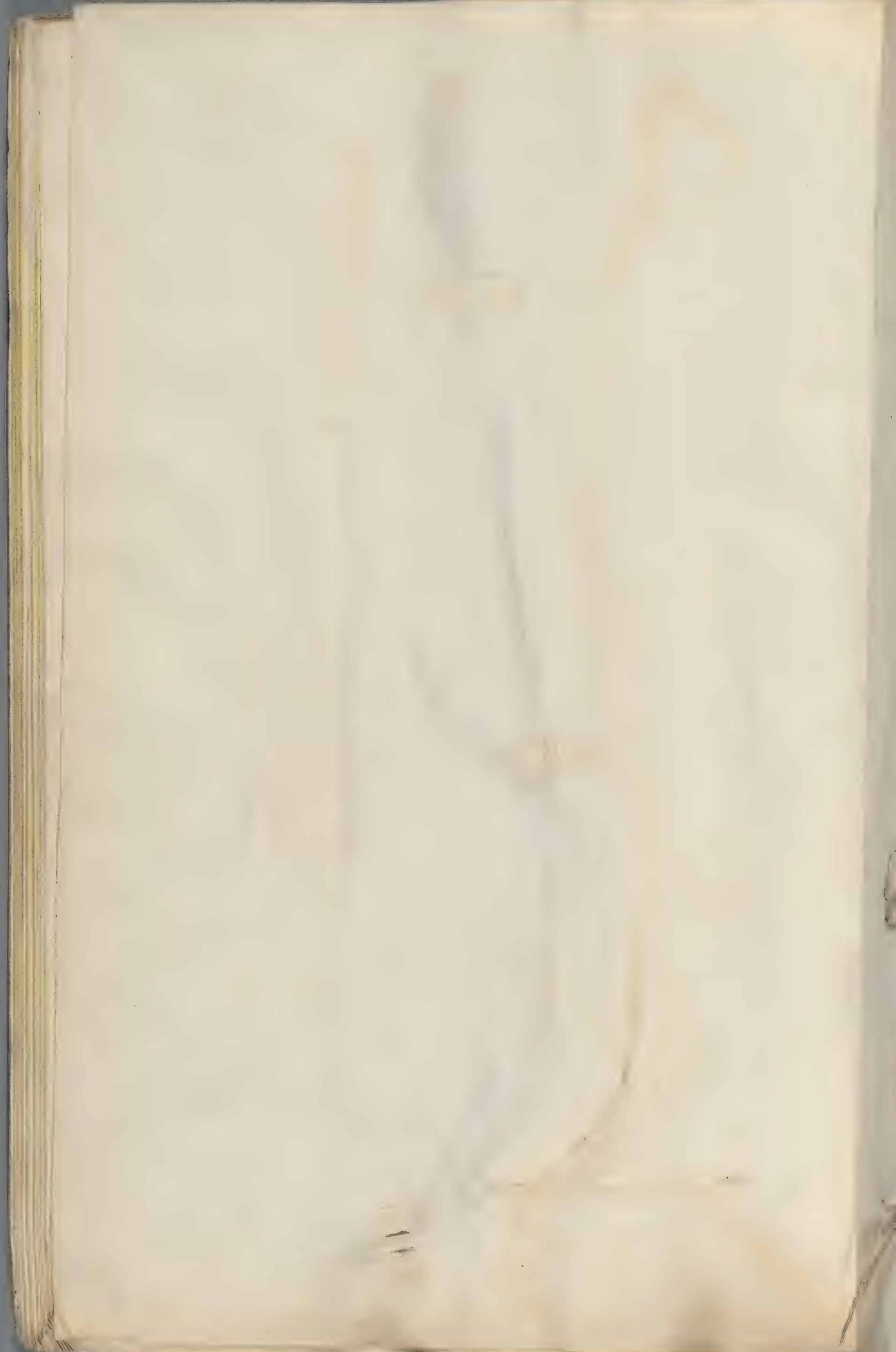






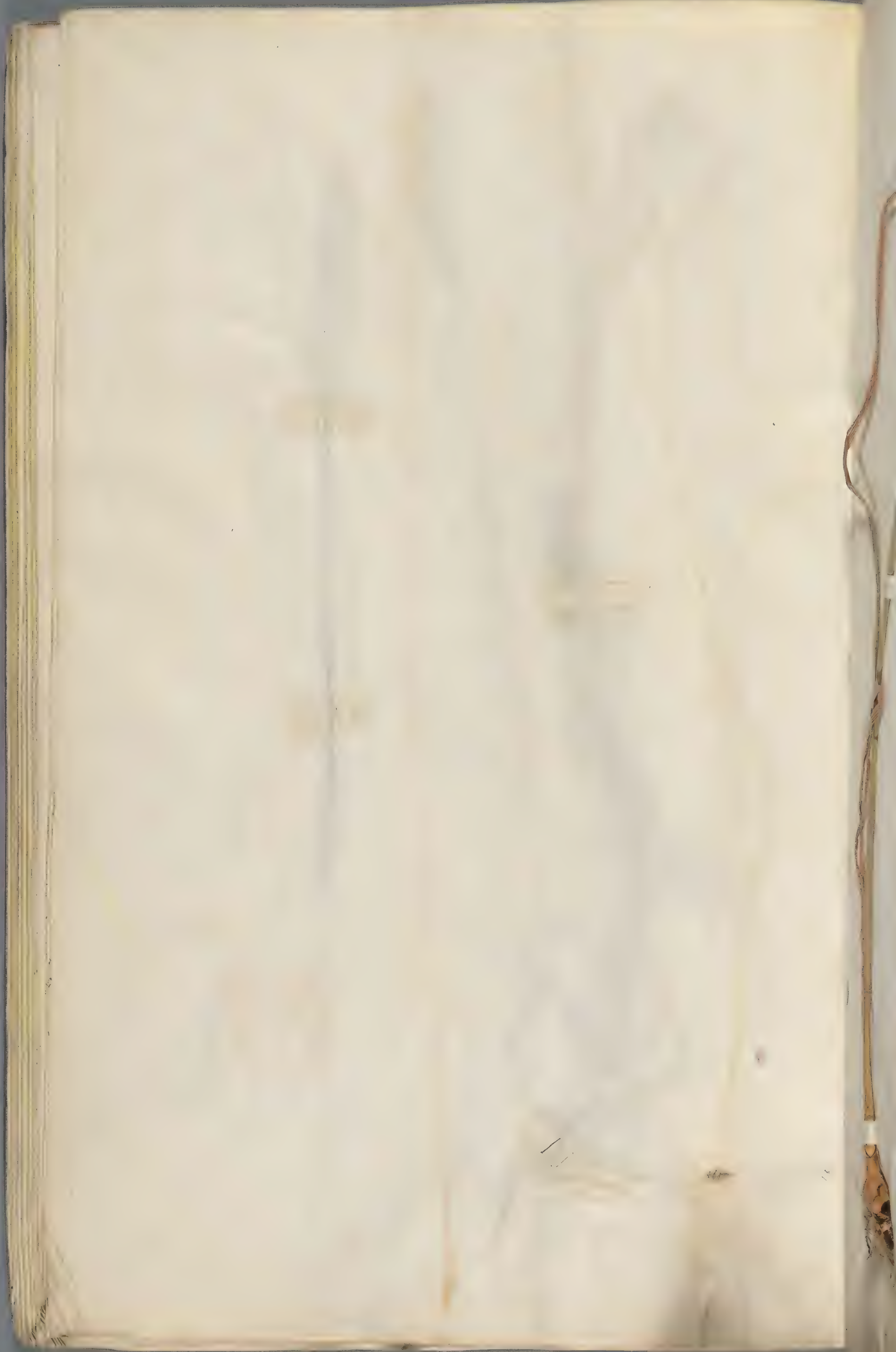
//



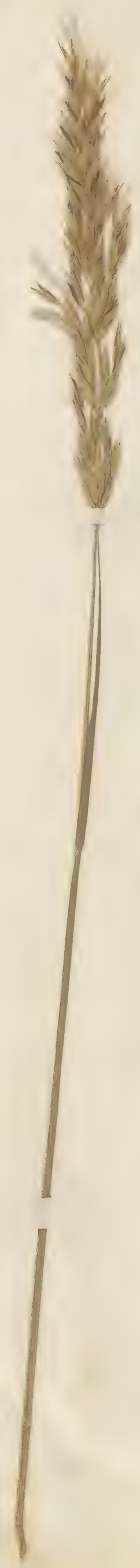




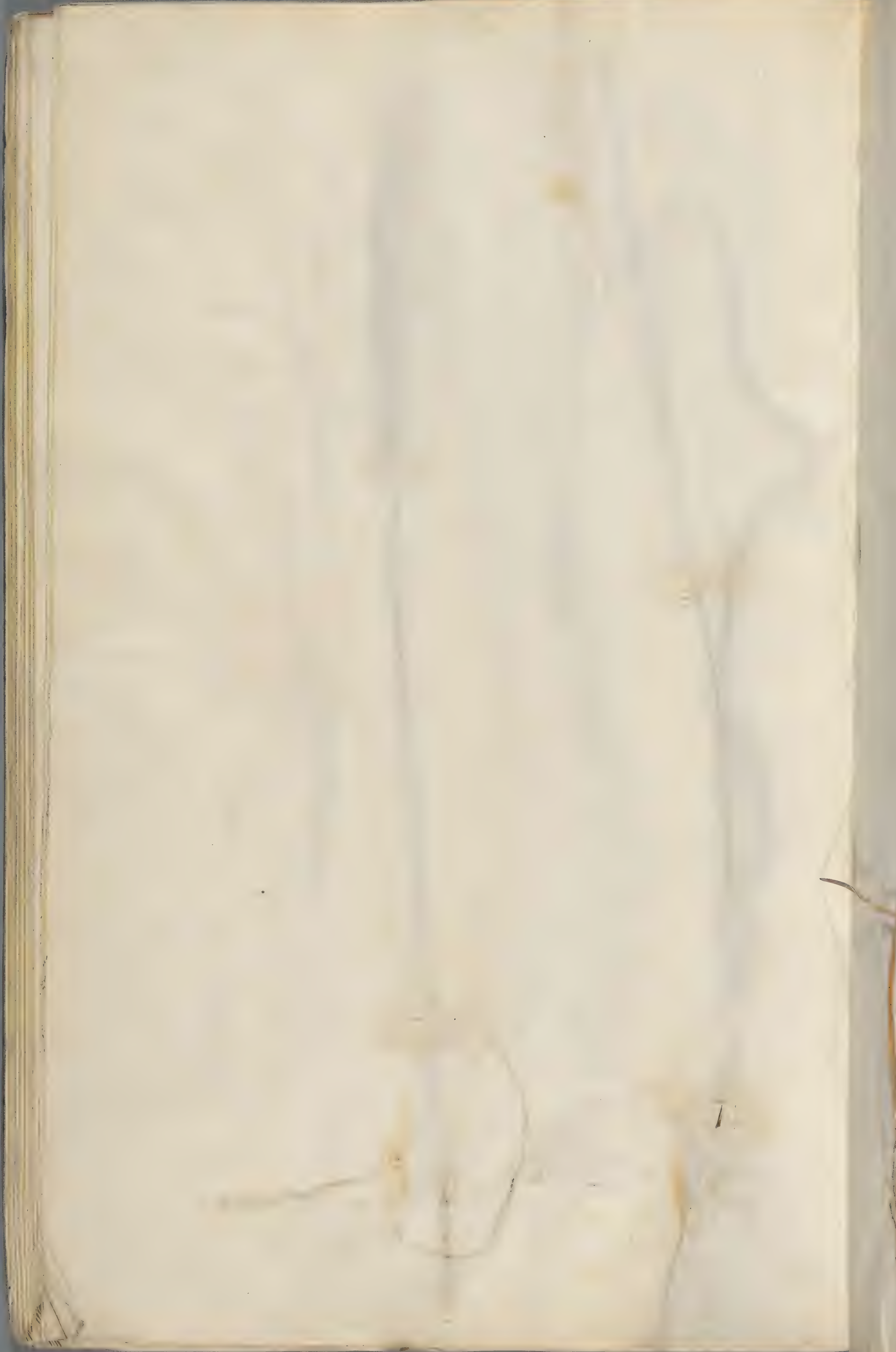
12



12



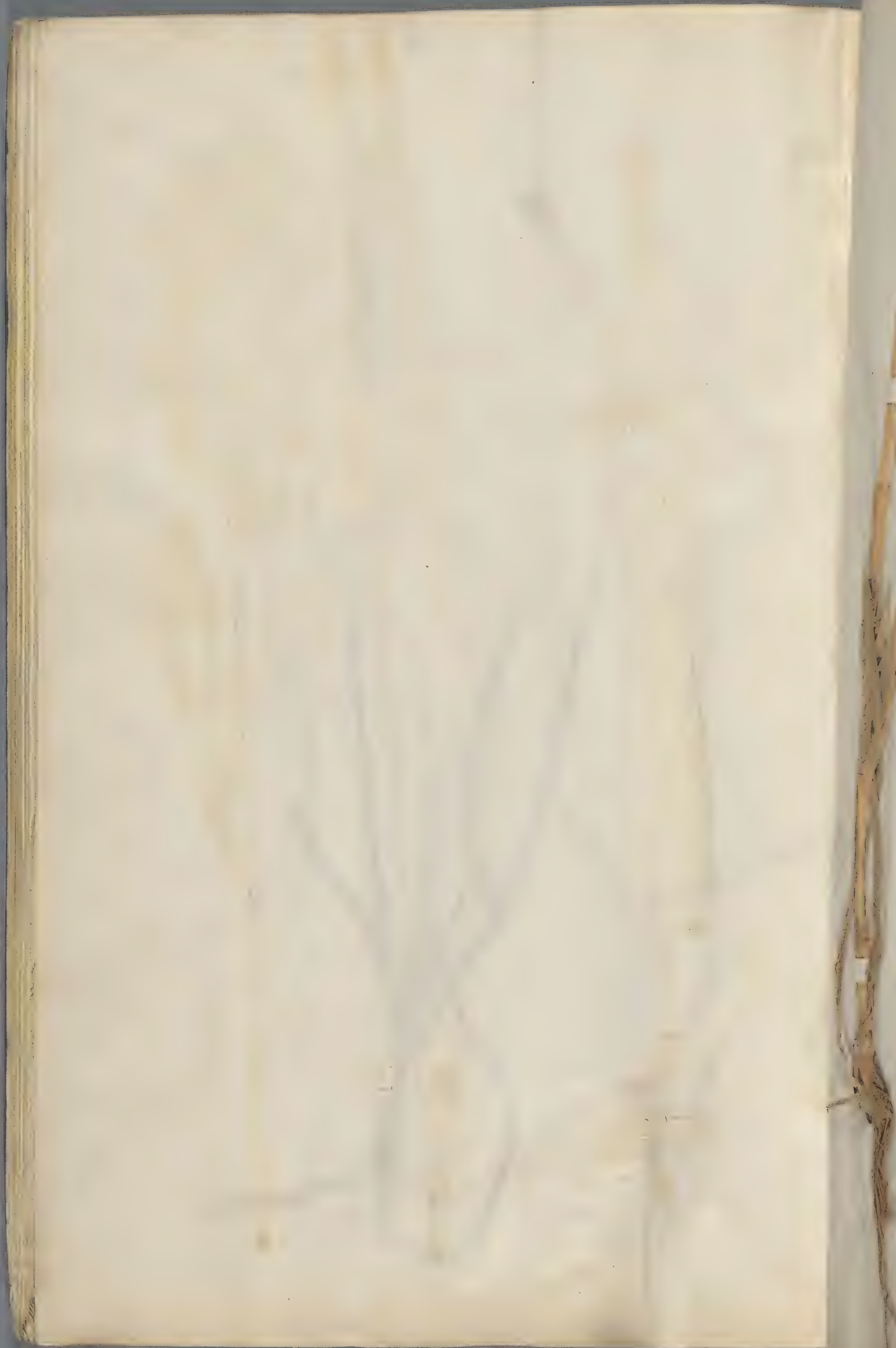
13



14

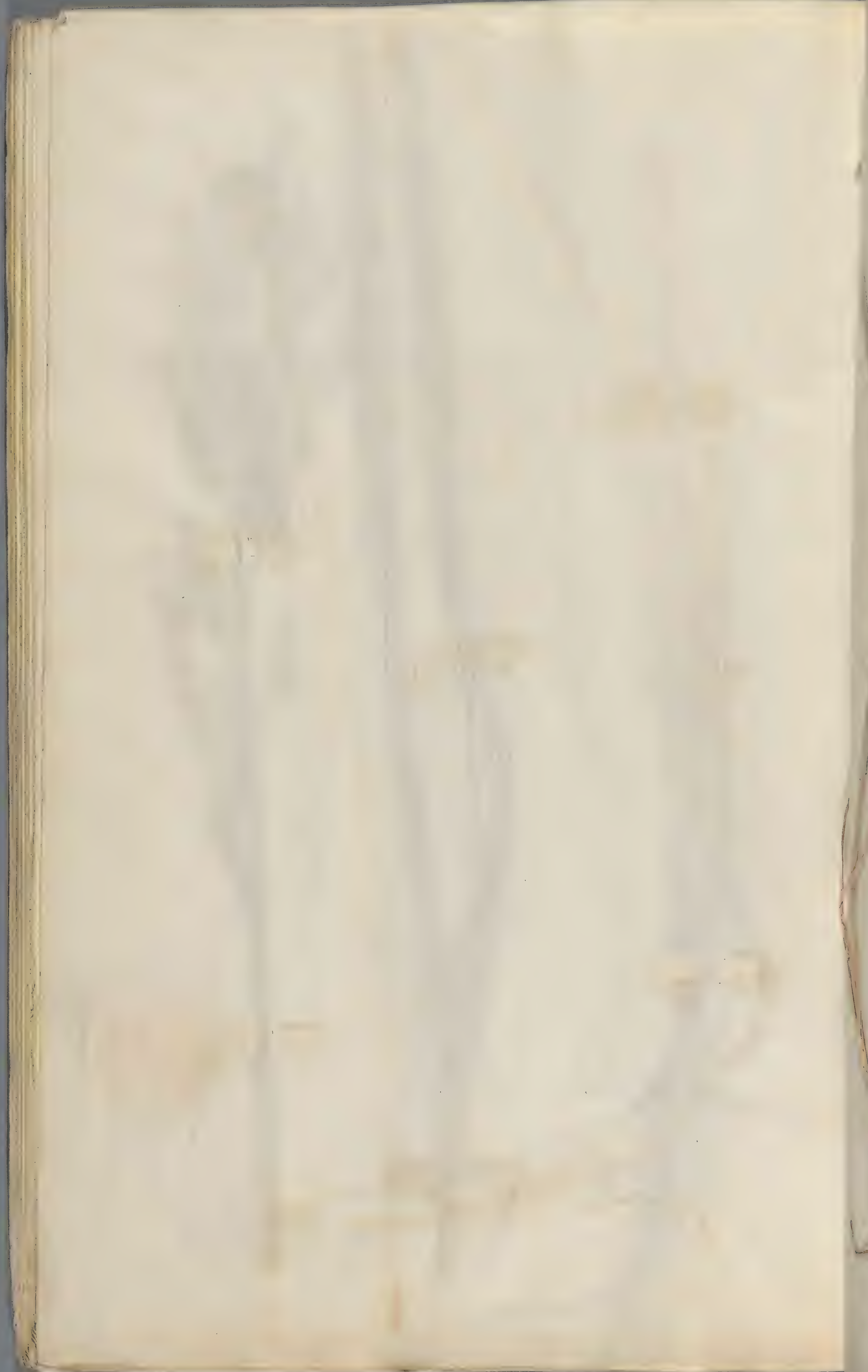
14



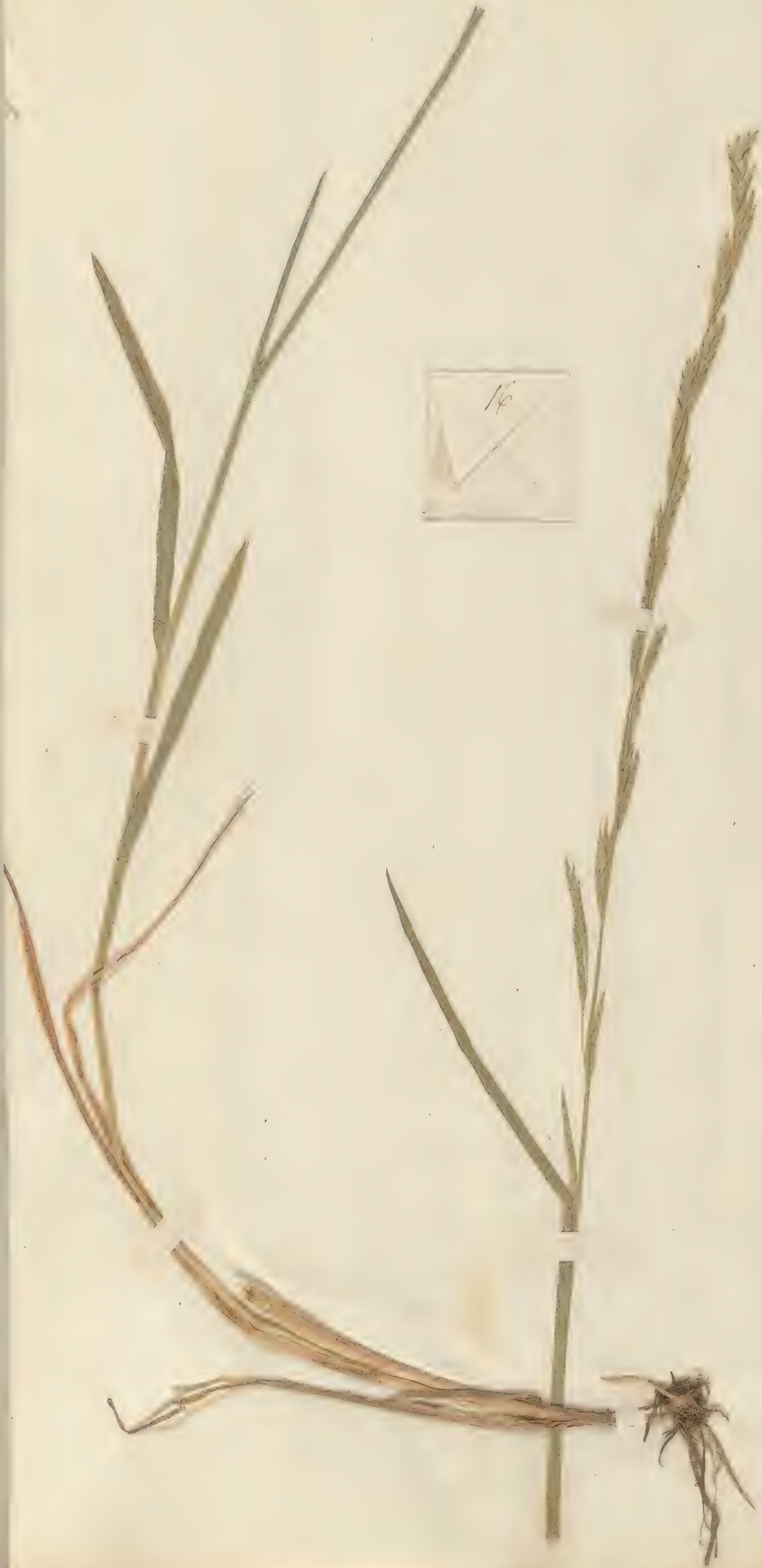


10





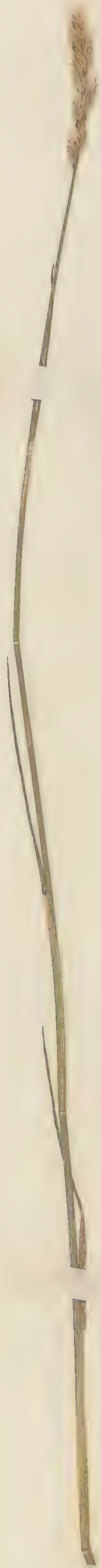
16



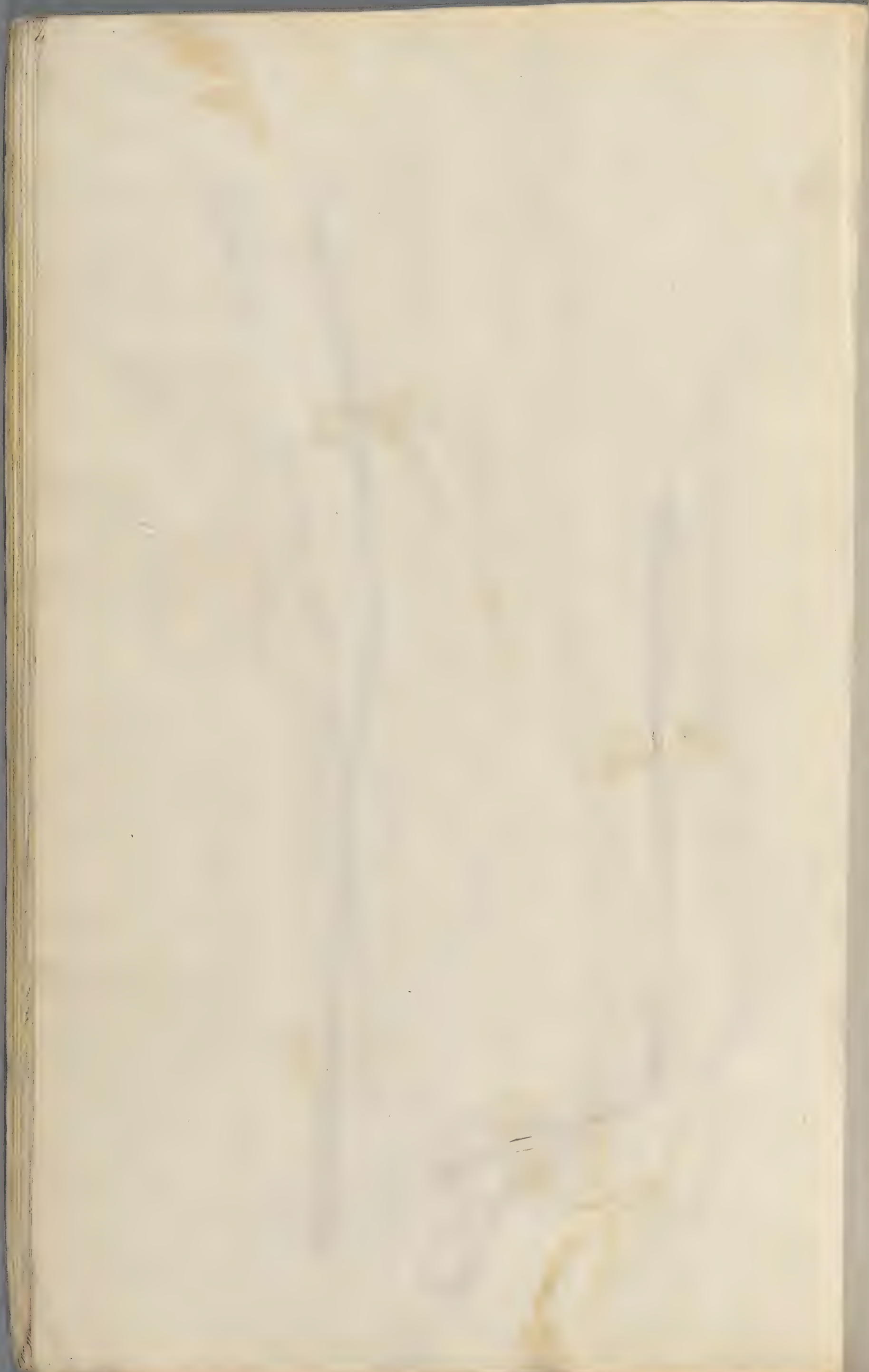
11

11

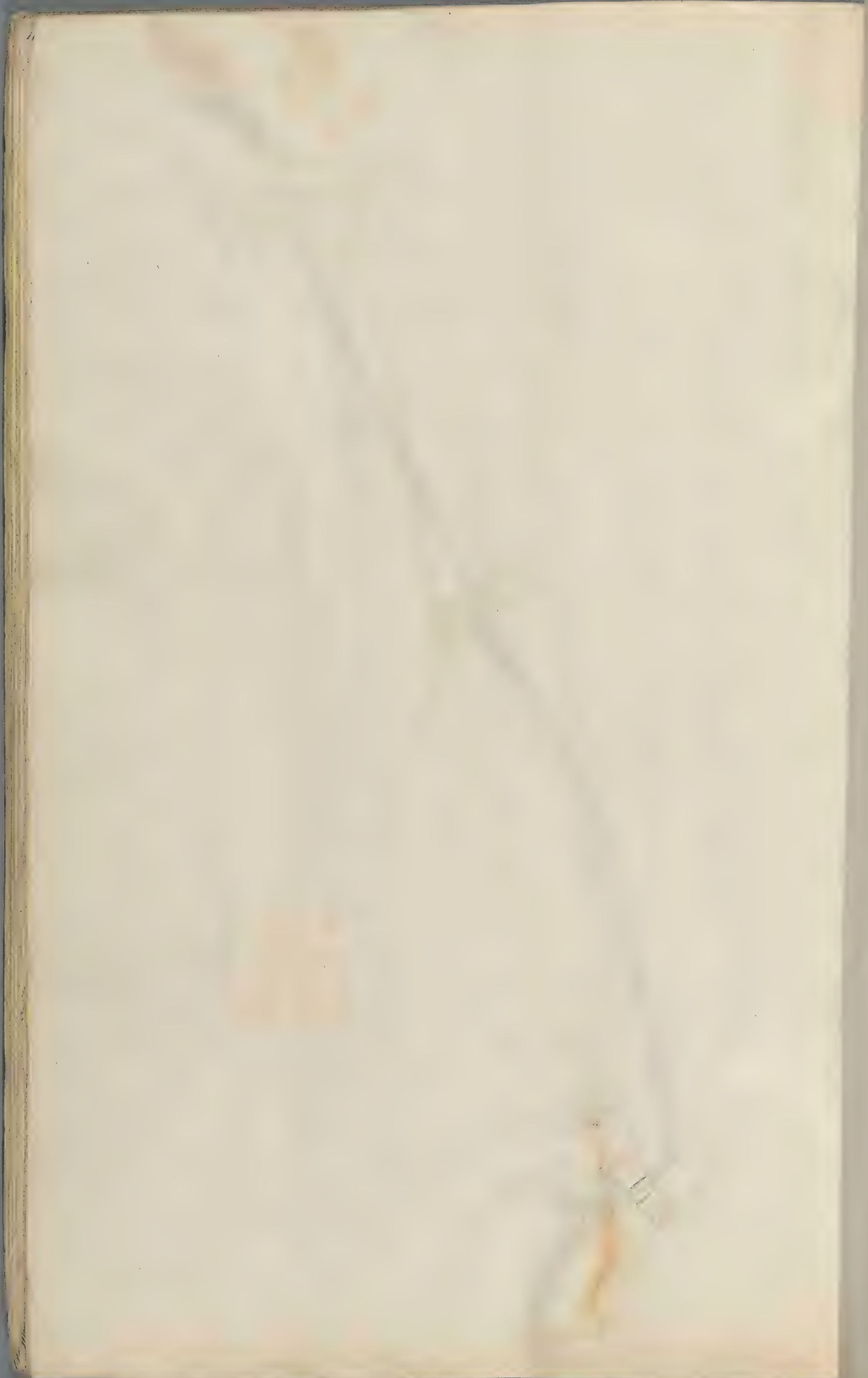
17



17



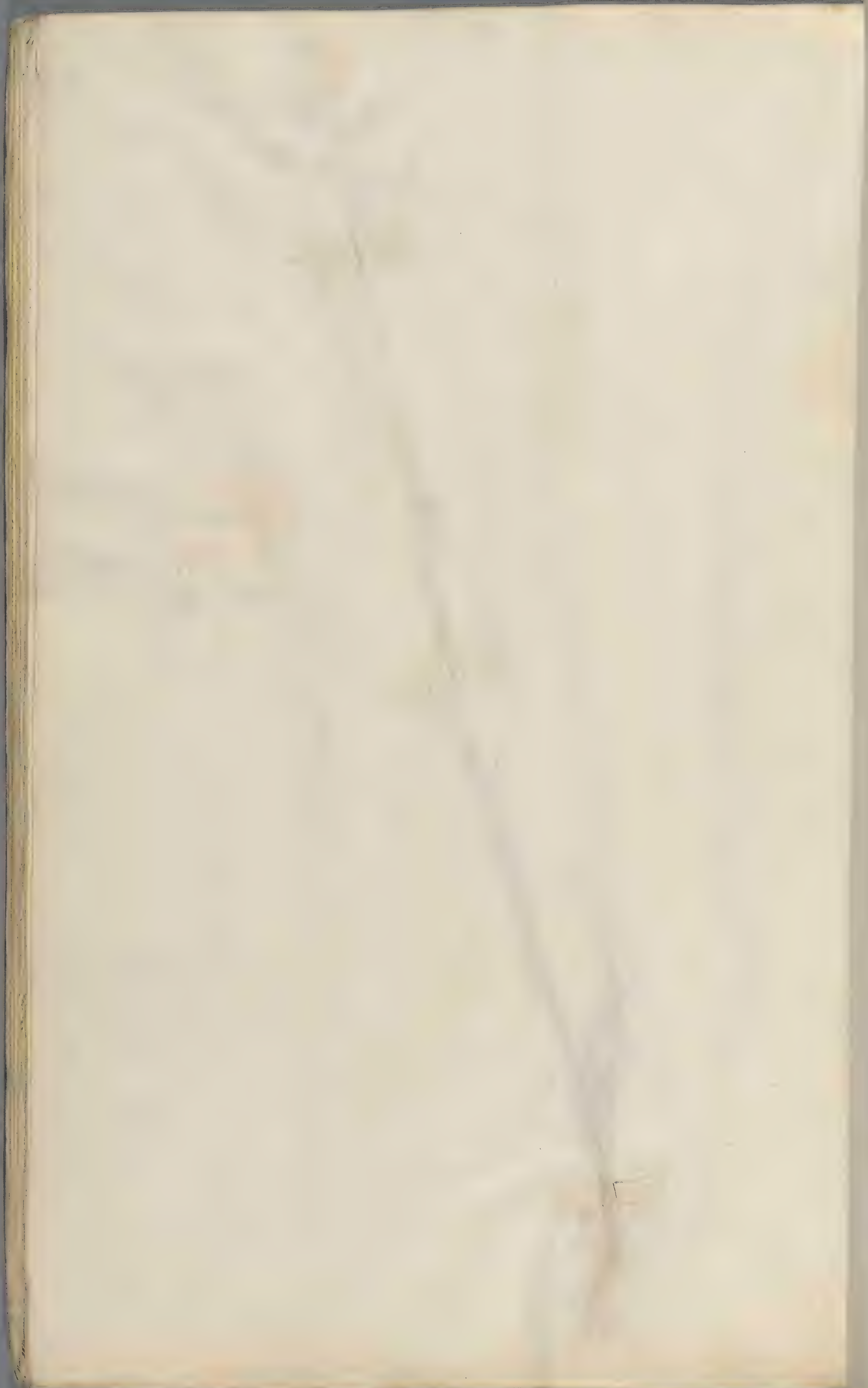


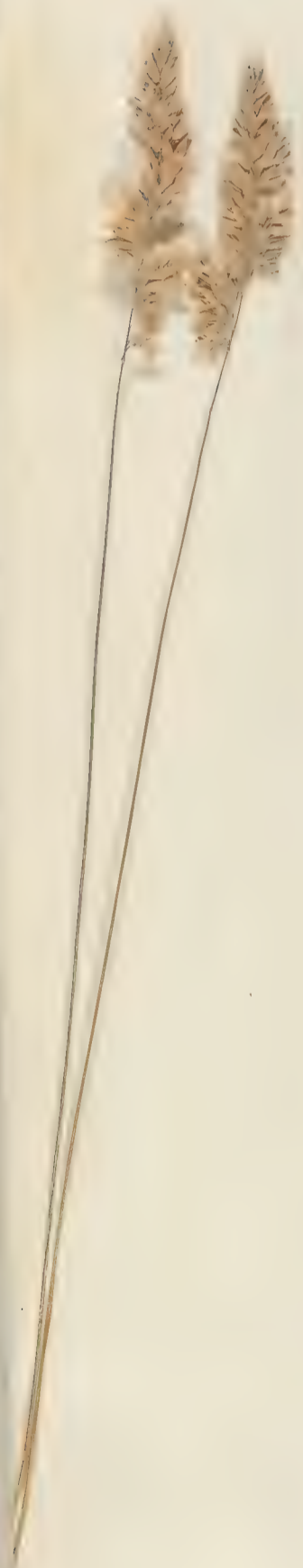


19



19





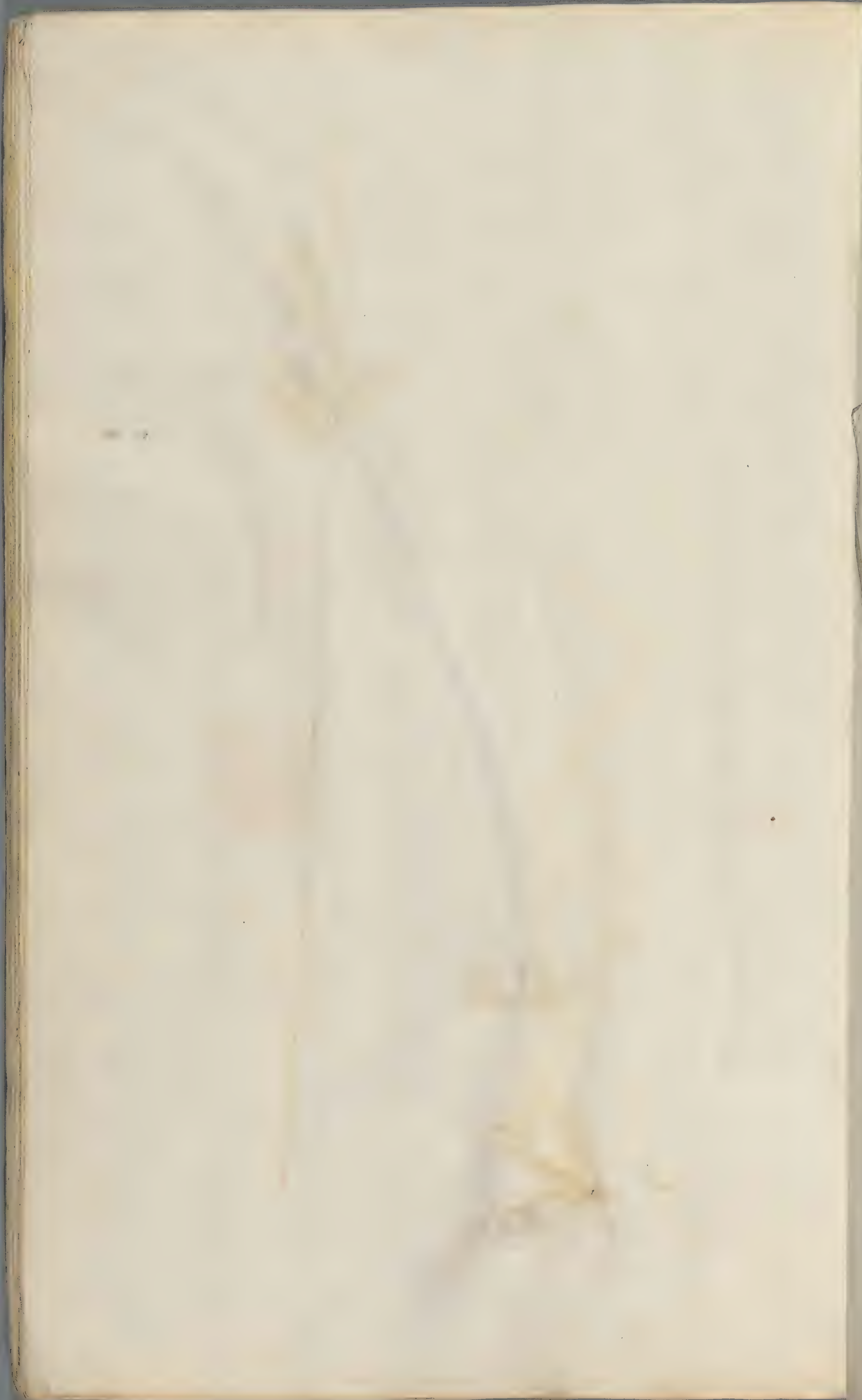


27

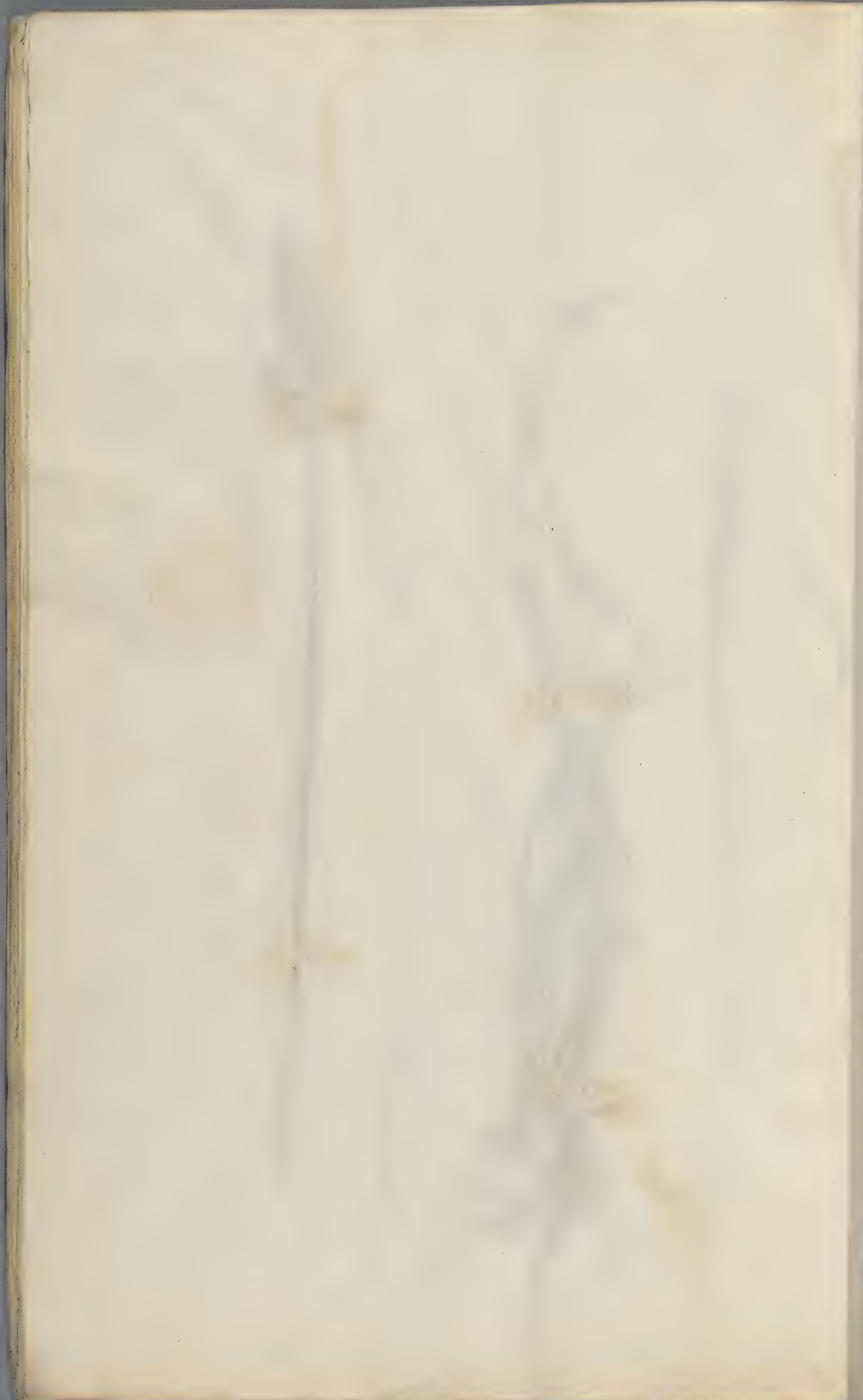


21

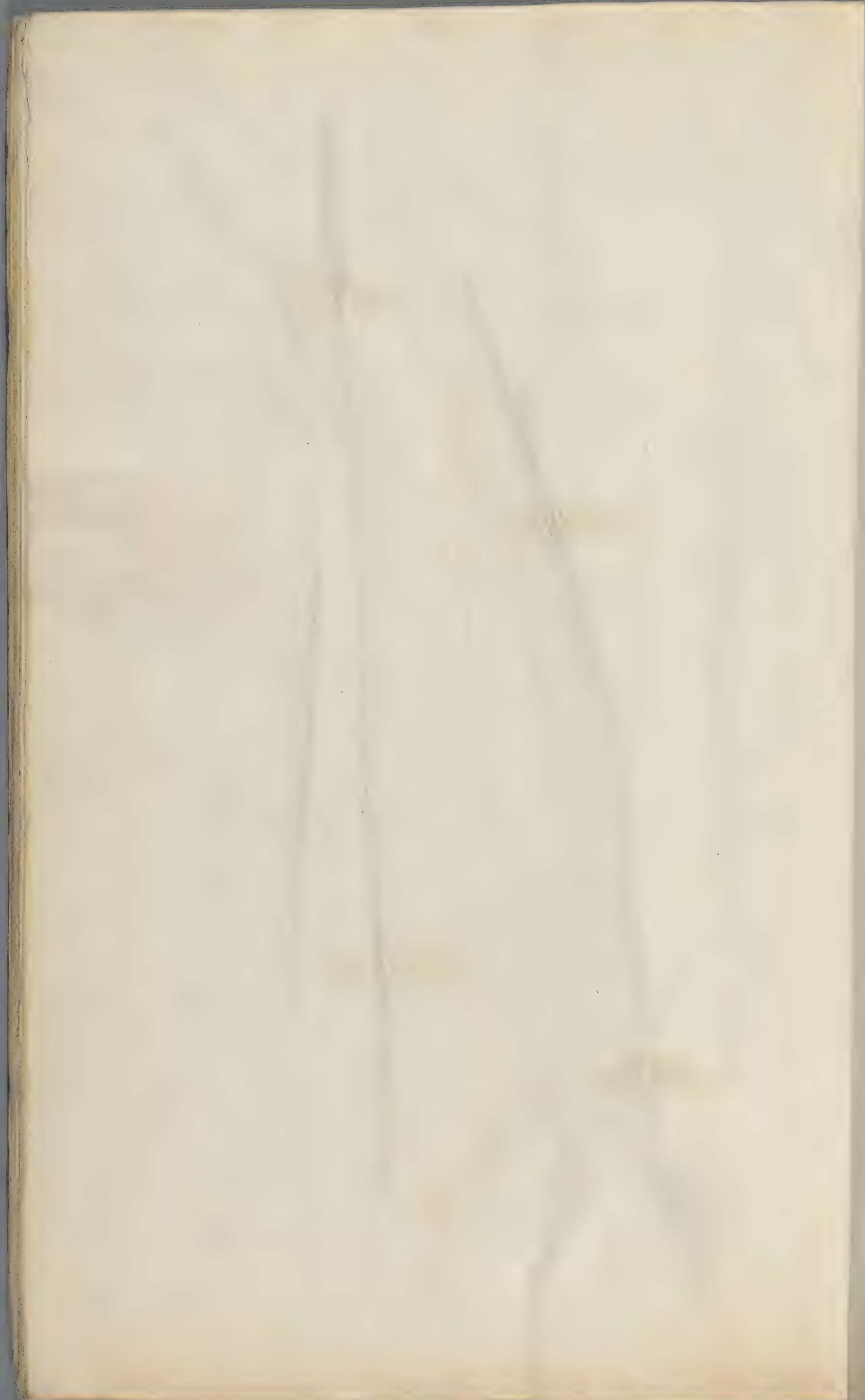






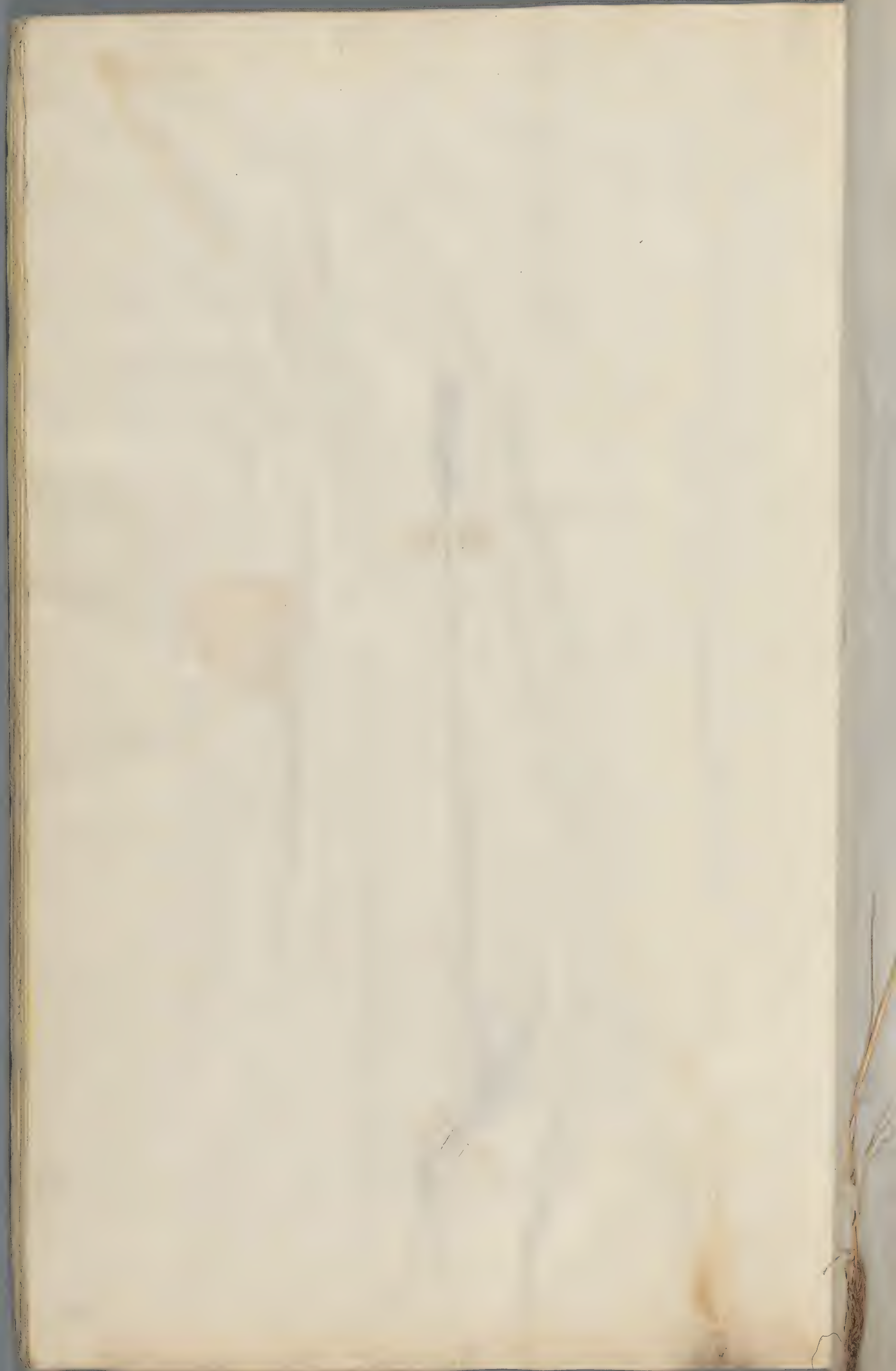






27





23c





201



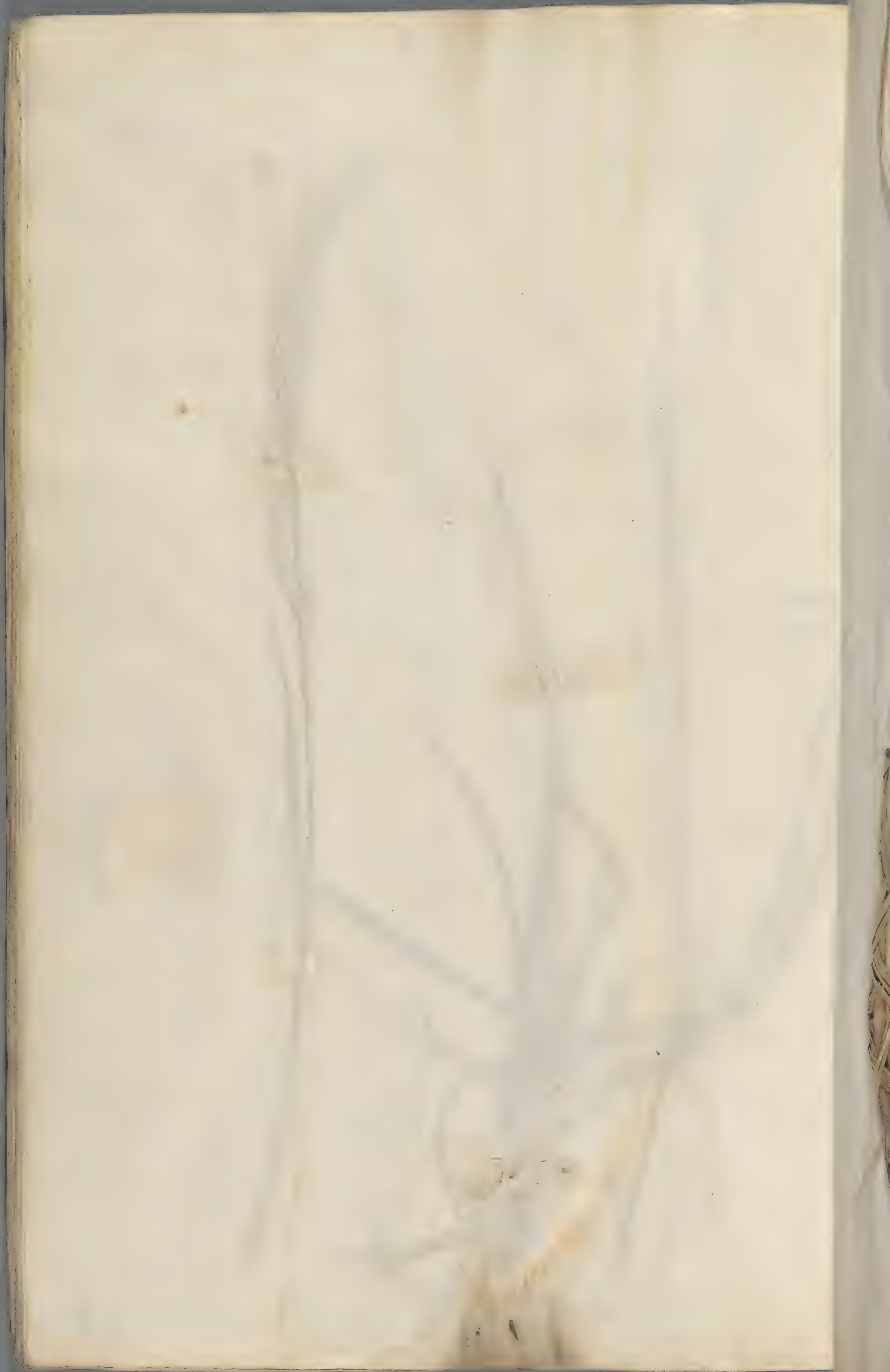
0

17



0

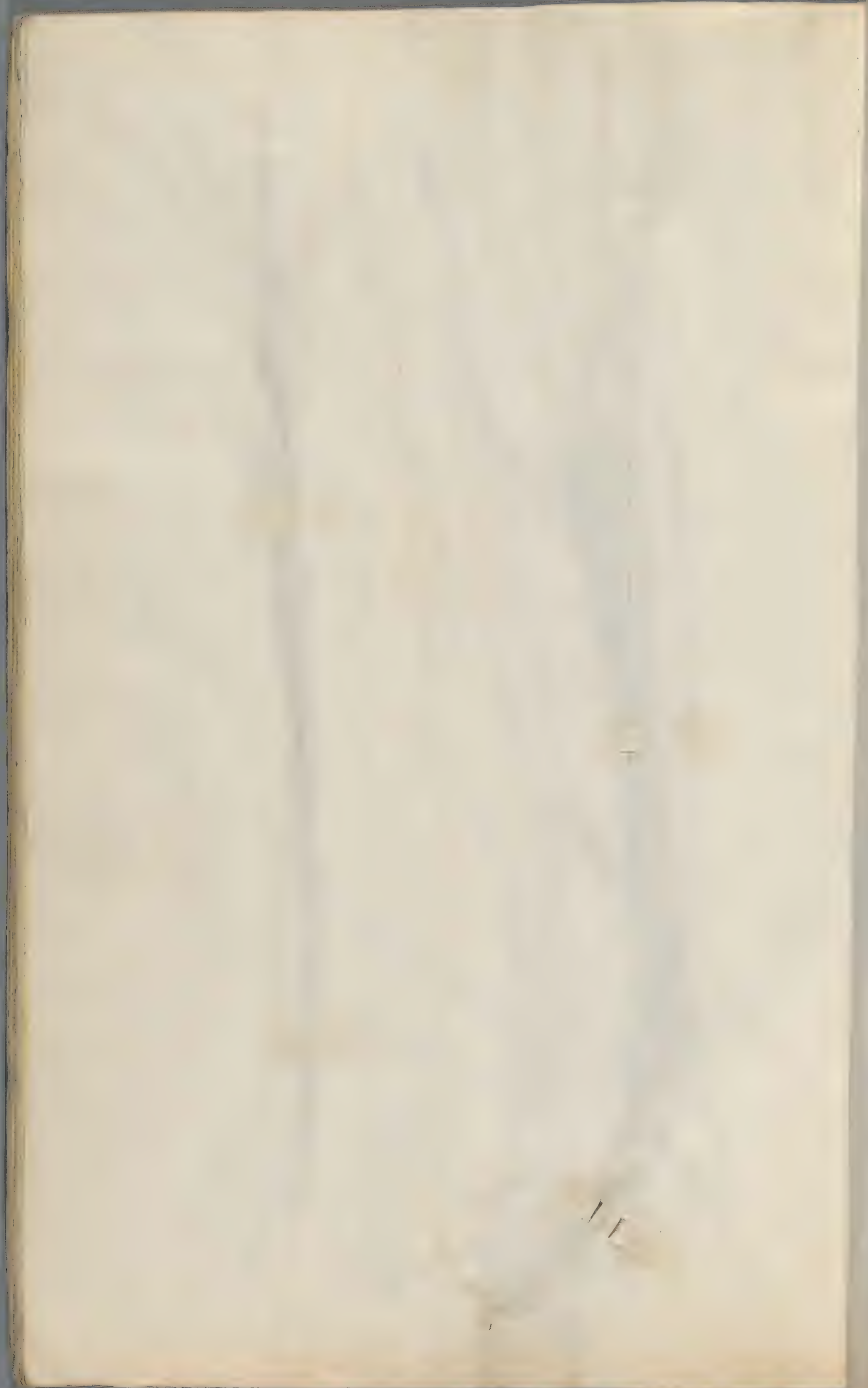
27



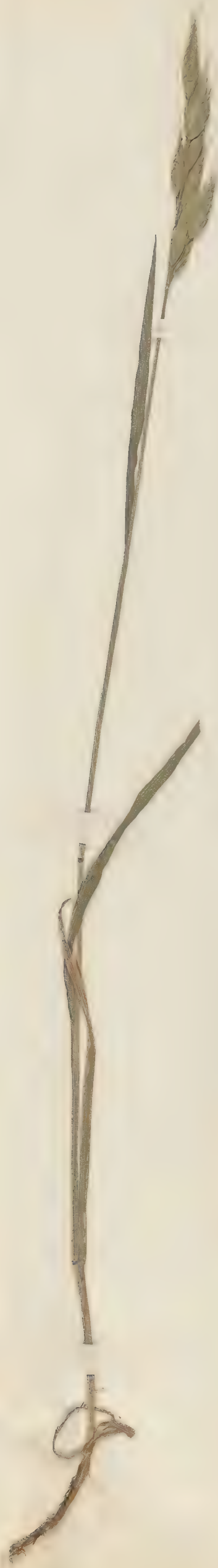


Handwritten text, possibly a name or number, enclosed in a rectangular box.

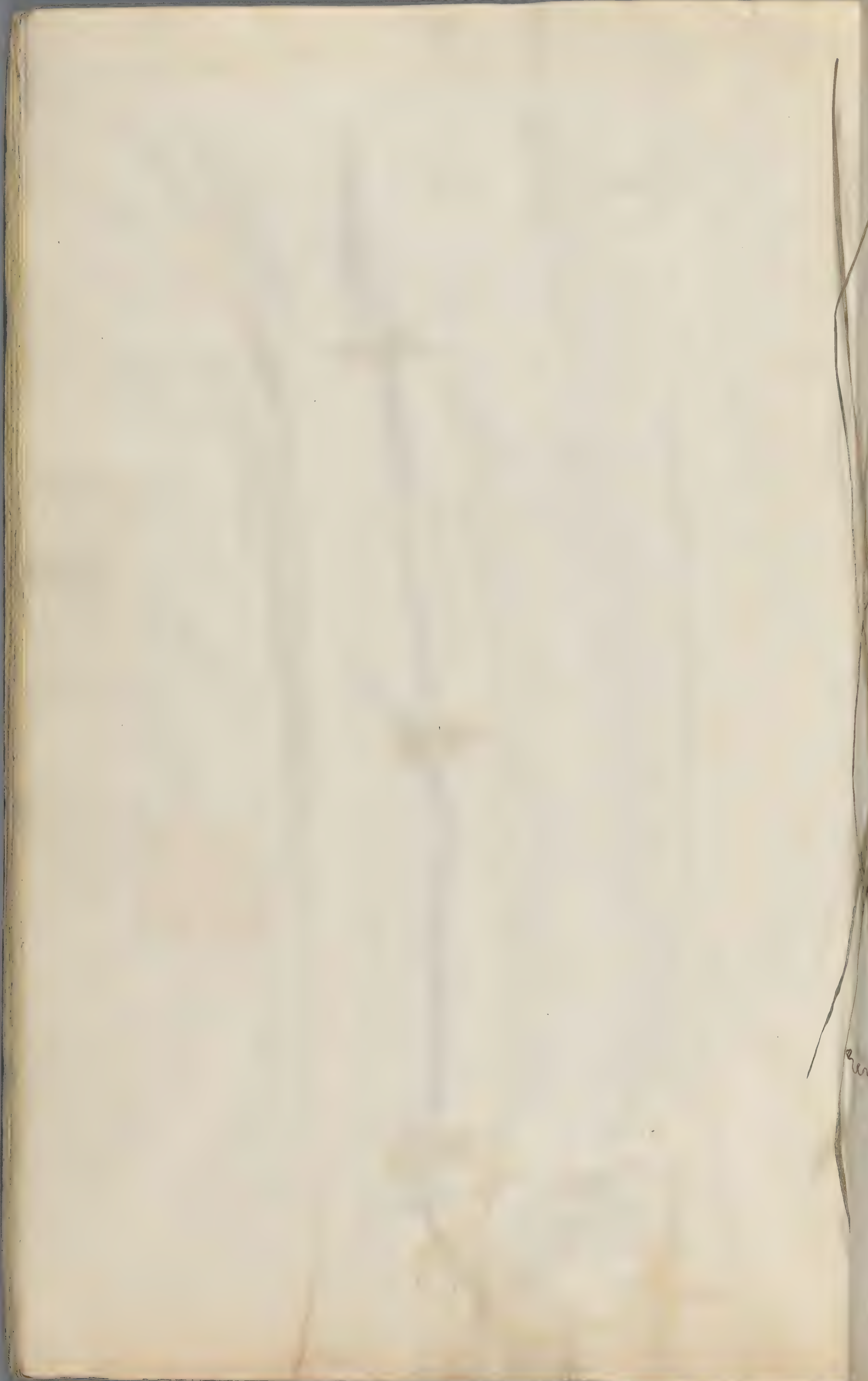




29



29

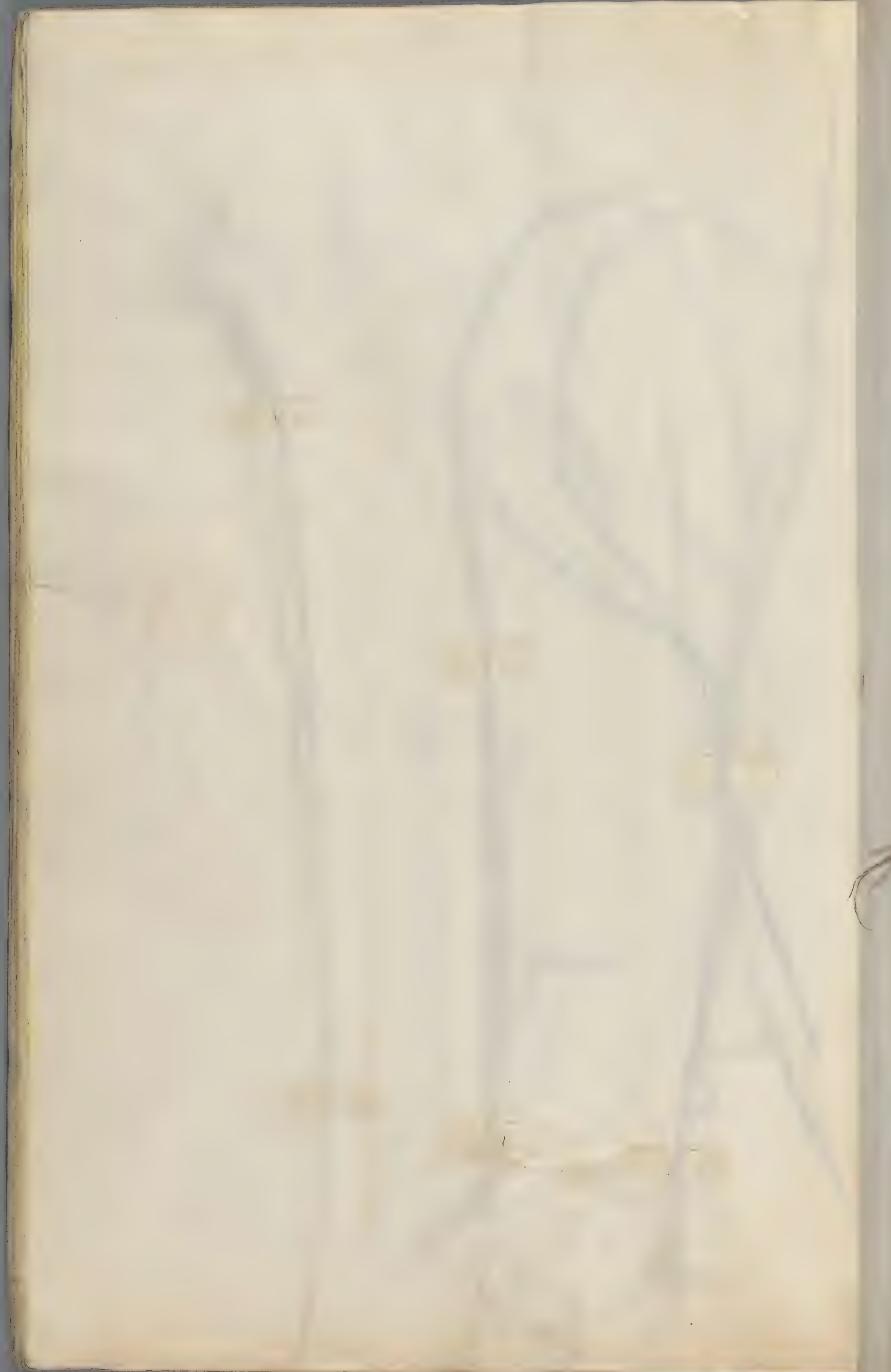




peru



30

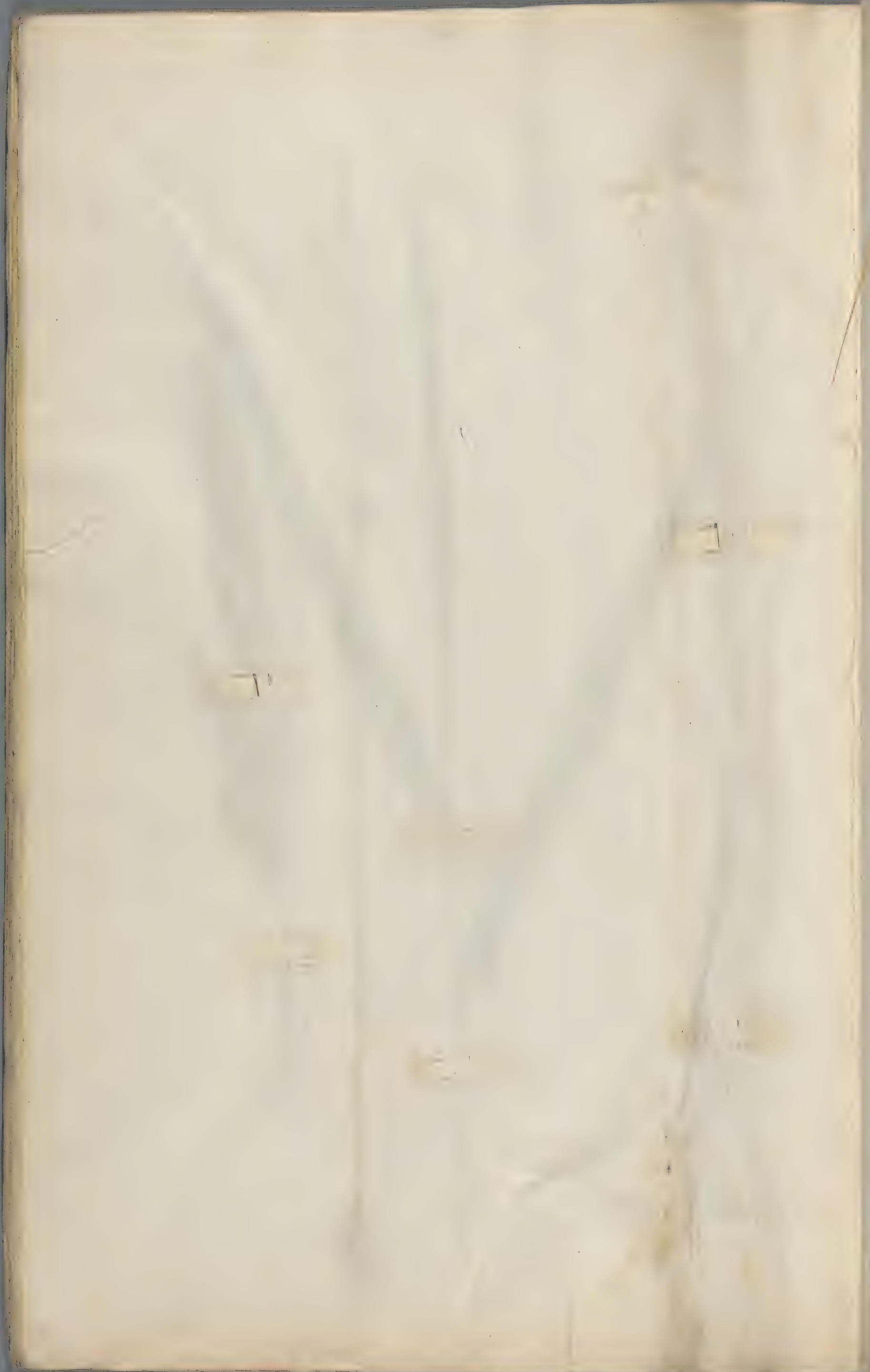




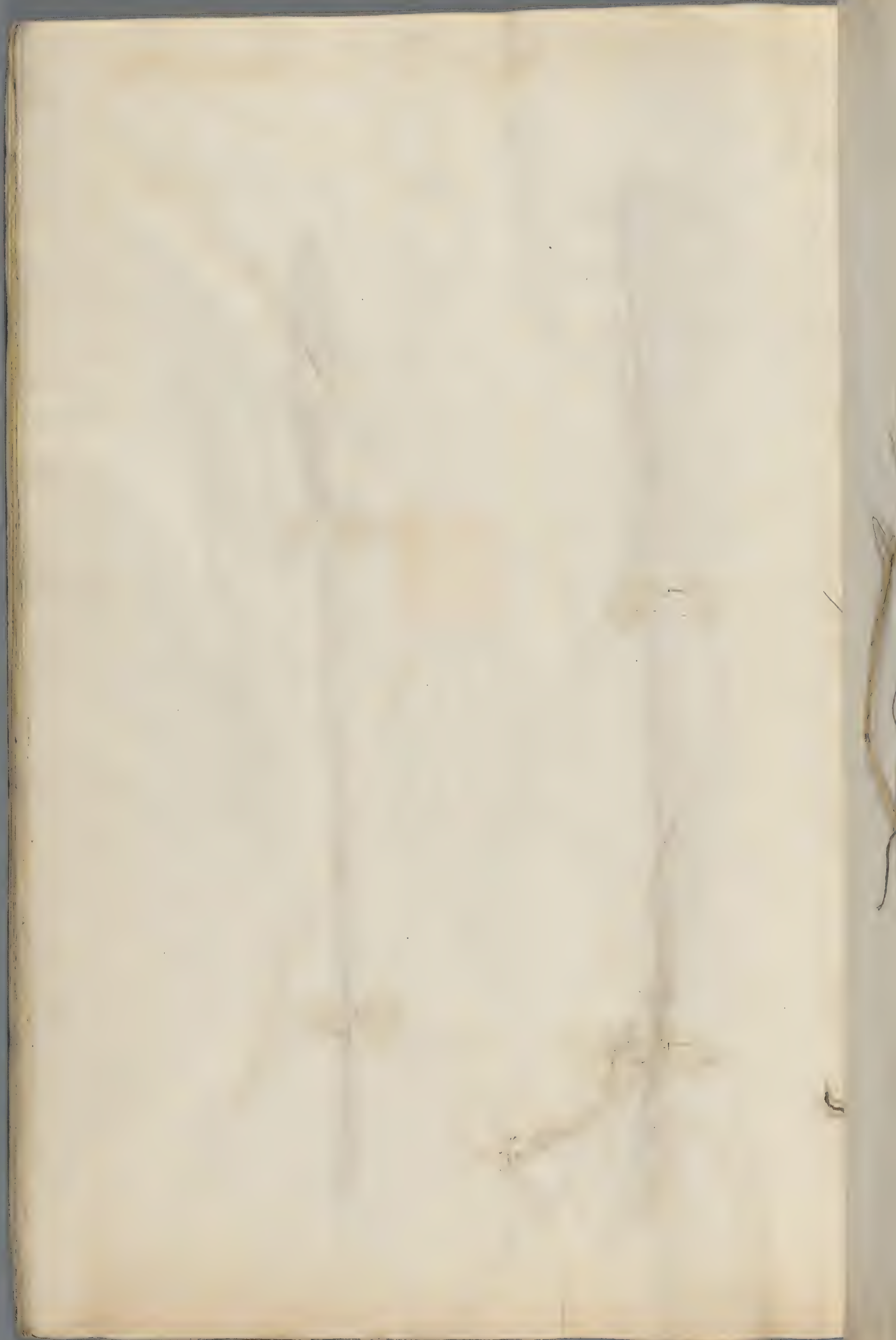




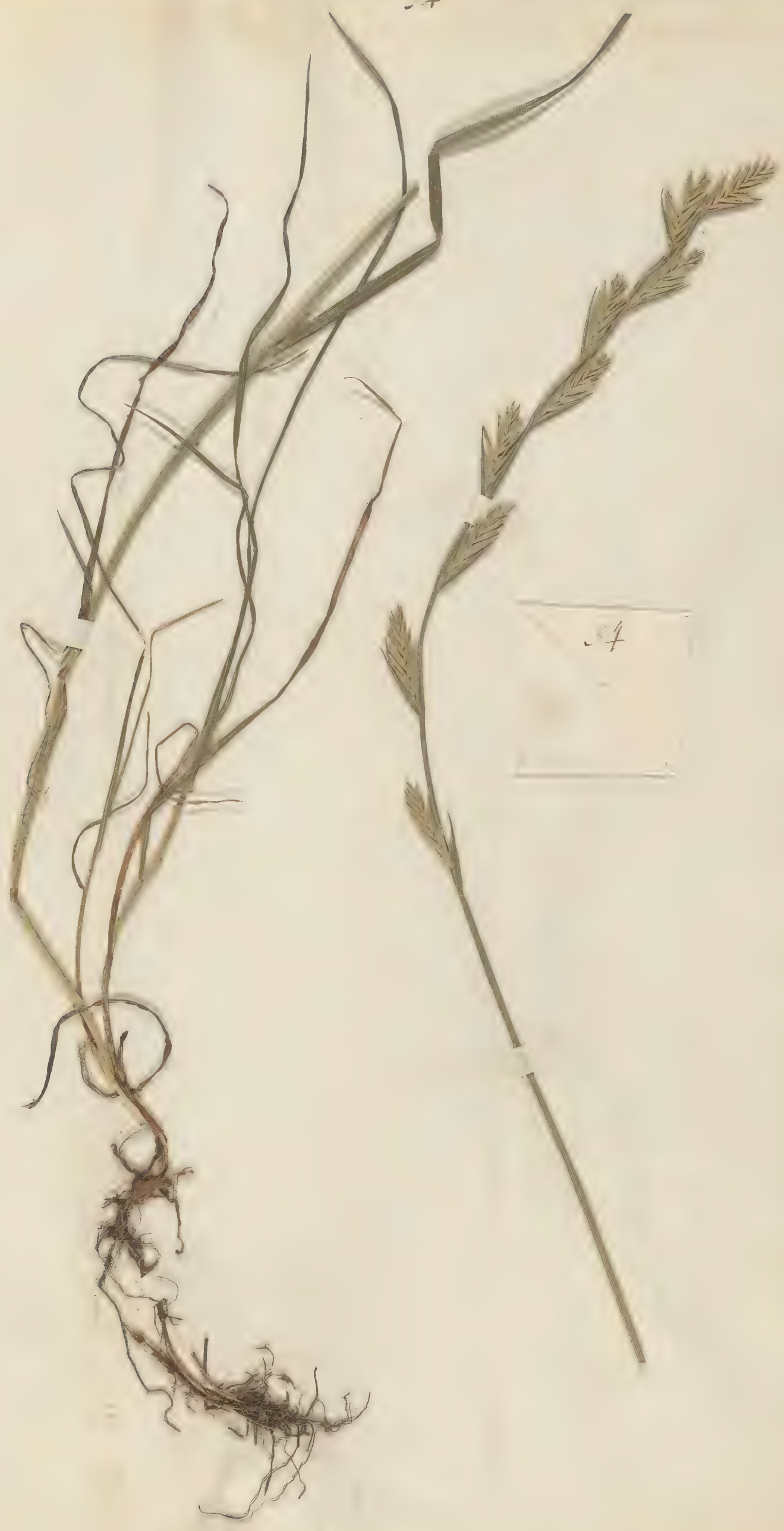
32



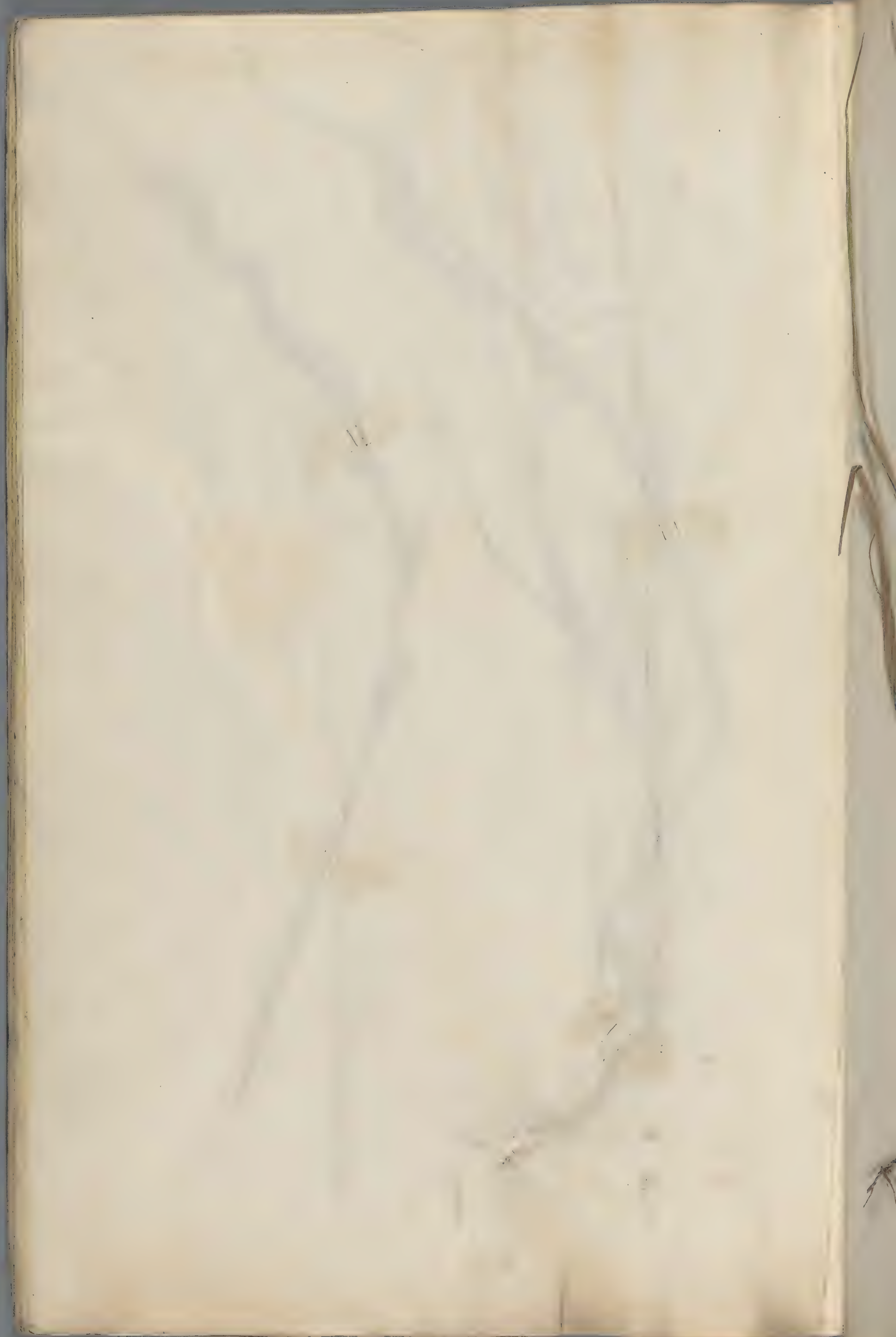




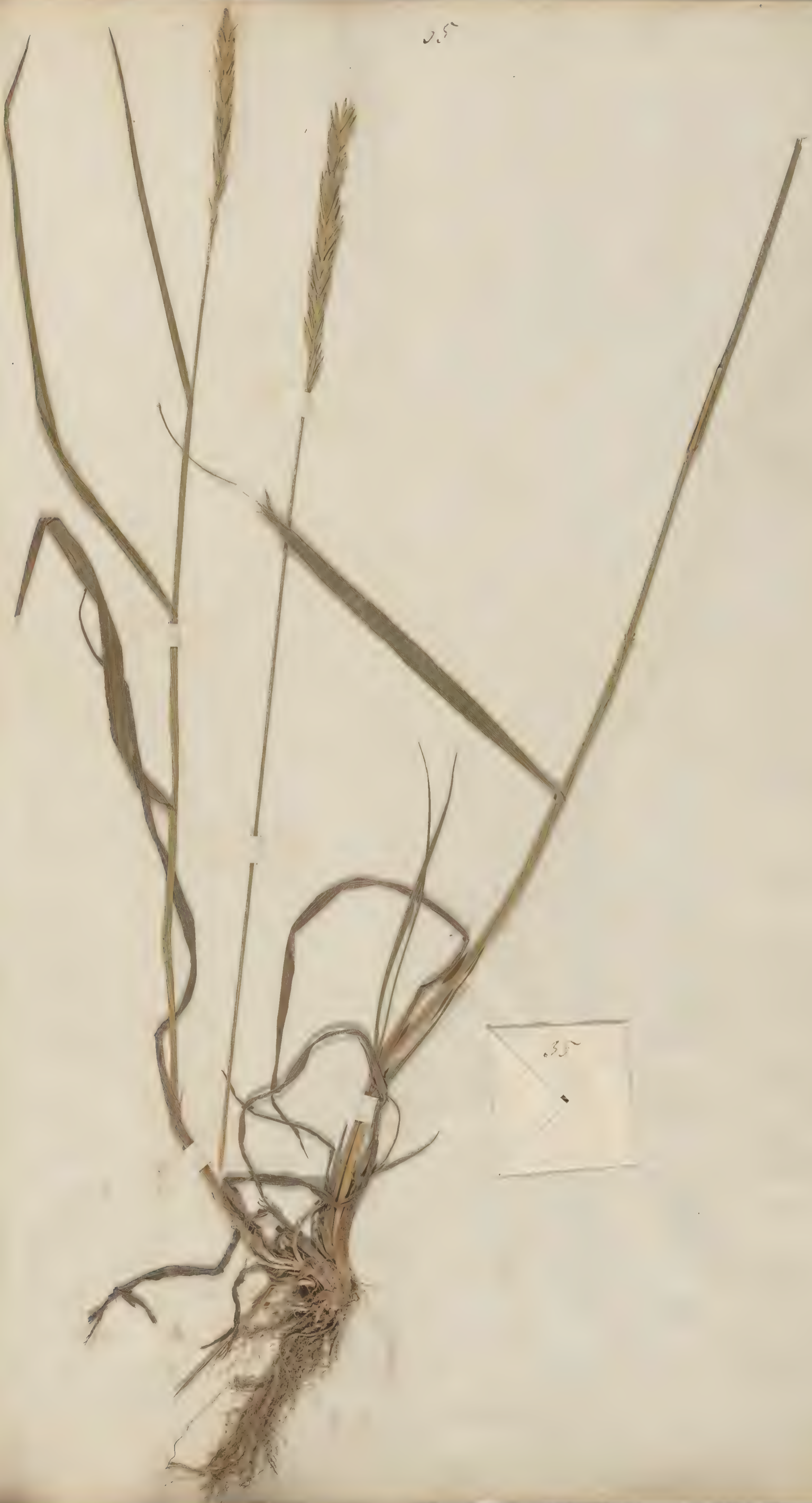
57

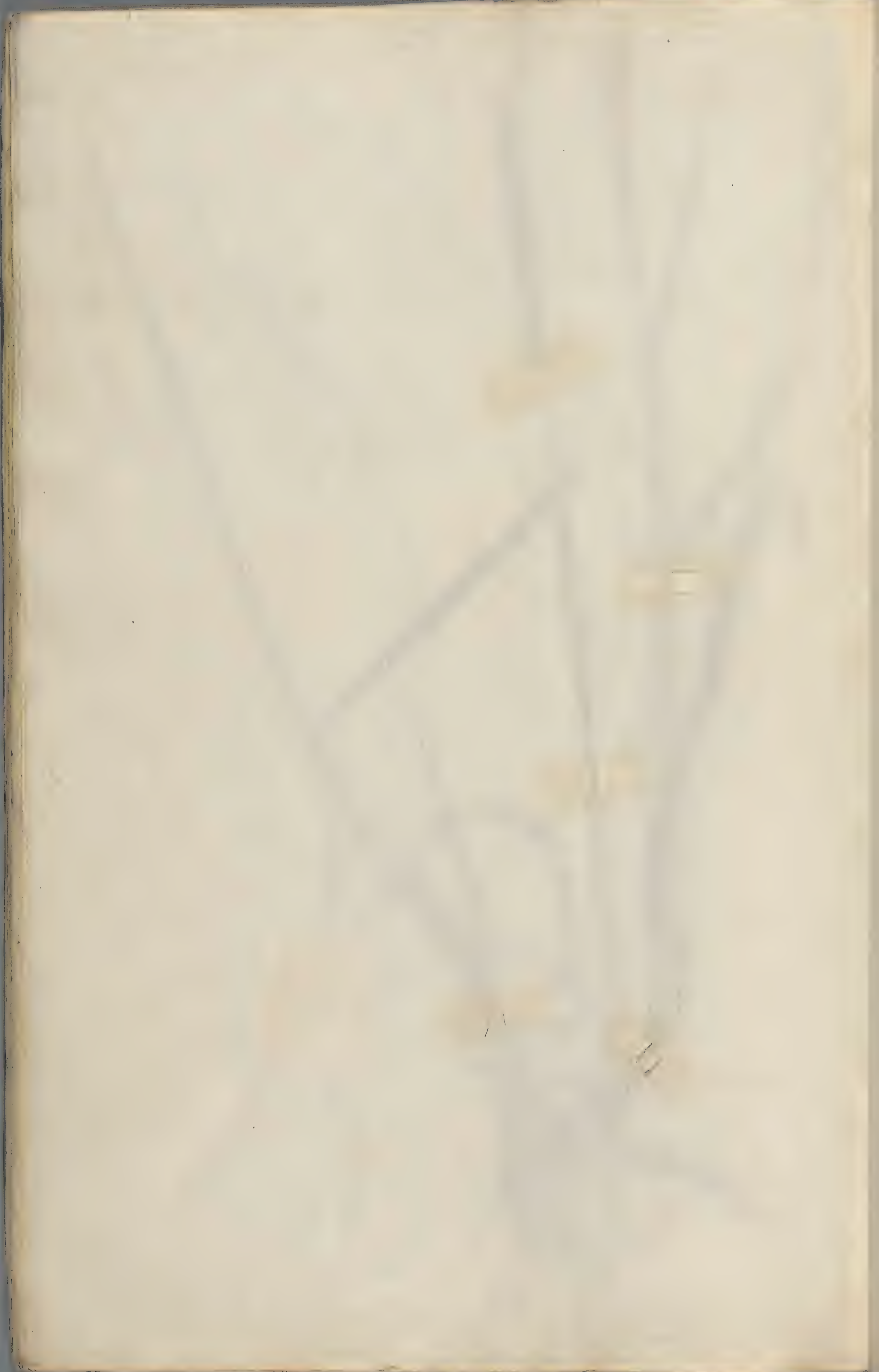


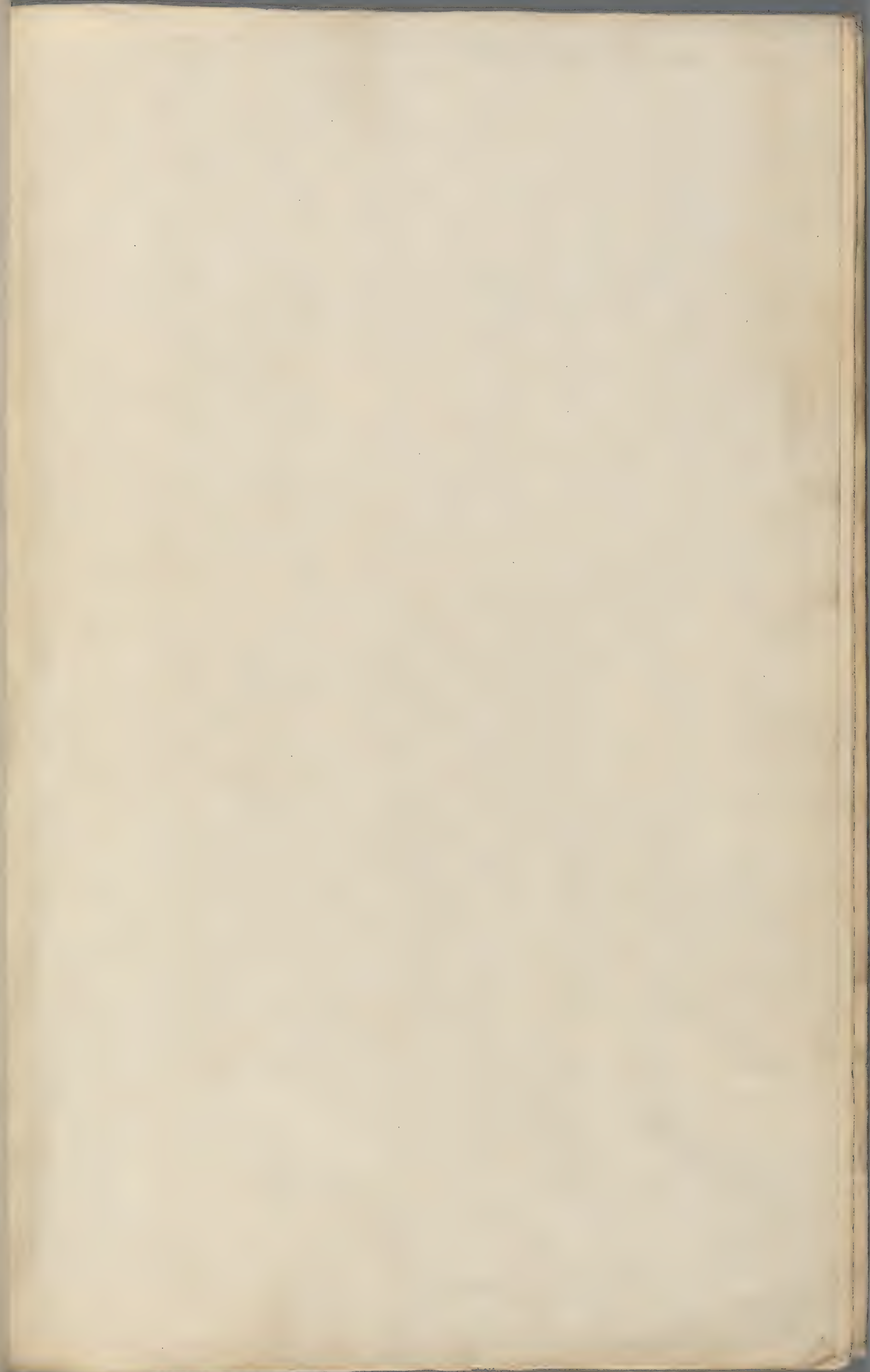
57

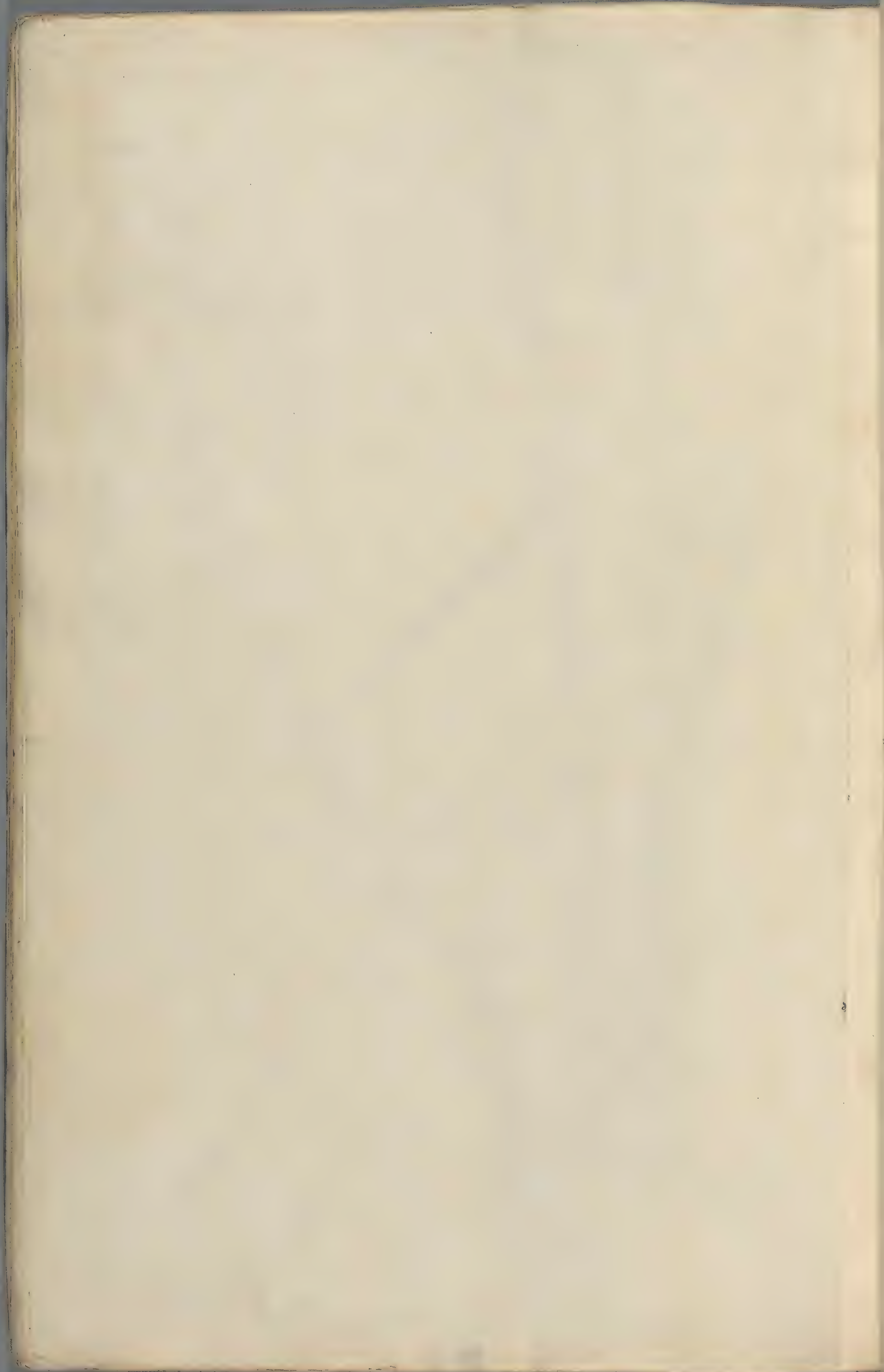


25









FOR 112

Original facsimile of a letter

