

FRANK NASH JACQUES



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THESIS.

JUNE GRASS

J. N. Jaques, 1896.

THESIS

Grass
Title Grass grass

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F. N. Jaques.

July 13th, 1896.

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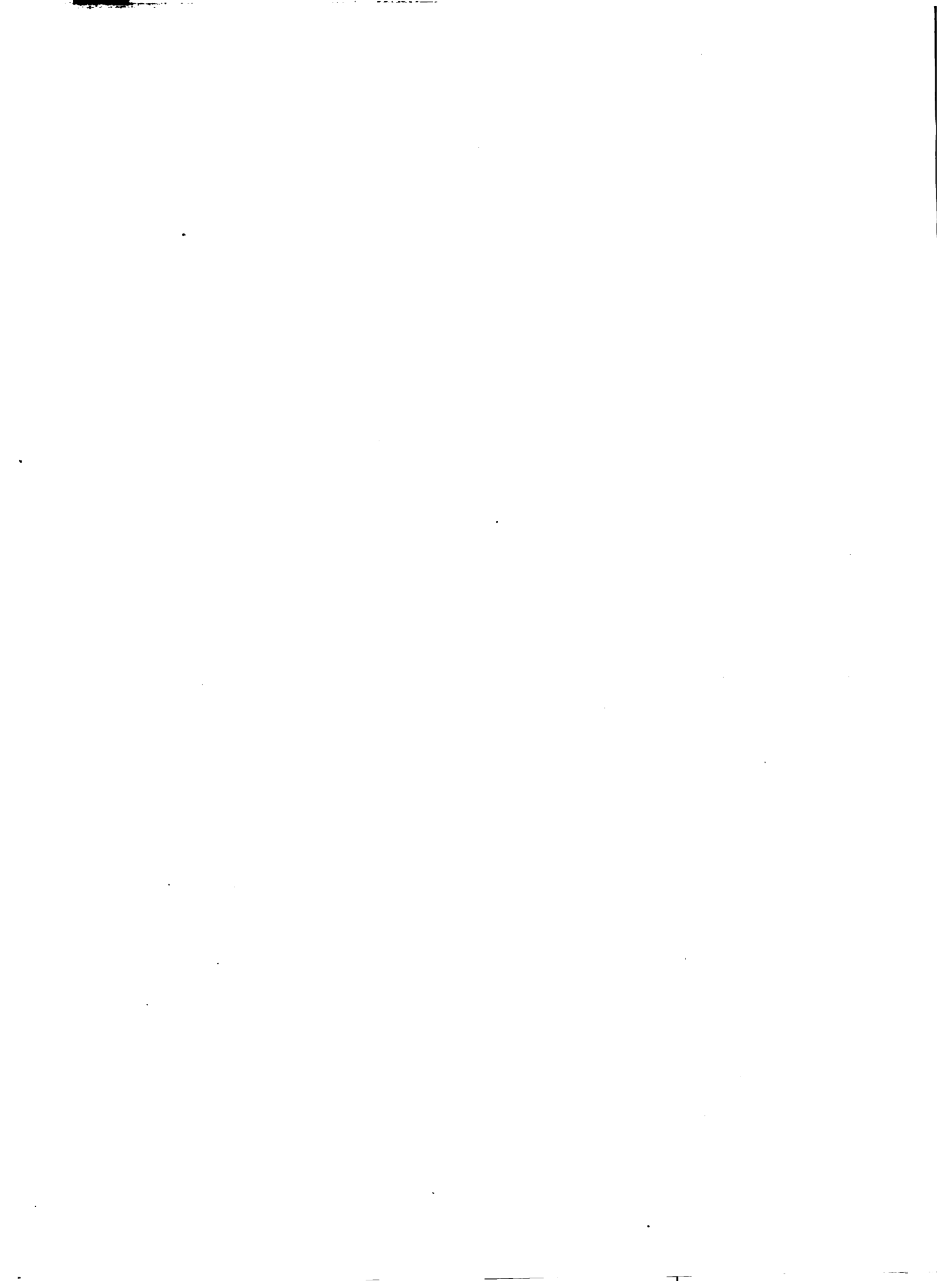
JUNE GRASS.

The grain of the June grass is oblong, compressed, and with a groove on one side. The floral ^{glume} ~~lemma~~ and palea enclose the grain when threshed, but do not adhere to it.

The seedling grows from the seed without moving it, even though it sprouts on the surface of the ground. If in the ground the seedling pushes its way up through the soil leaving the grain where it is sown.

The root-stocks of June grass are underground stems. These branch out horizontally from the stem, because the sheath of the leaves are not strong enough to make them grow upwards. The rootstocks also branch at the nodes. These branches may progress some distance and then develop into a new plant. At the nodes of these rootstocks there are remnants of sheaths which gradually decay as the rootstock becomes old. The rootstocks are terete or nearly so, and solid. They elongate at the tip when growing through the soil. This tip is quite sharp, sometimes penetrating bulbs and tubers.

The stems are terete or nearly so, and smooth. When young they are solid but become hollow as they get older. The stem is made up of nodes and internodes which vary in length. The stems elongate mainly at the lower end of each internode. The lower internode becomes mature and fixed



and incapable of elongating the first of any, and so on in regular succession to the lower part of the upper internode, which is the last one to mature. In case the grass becomes lodged the lower side of the node will elongate until the stem becomes erect, or at least curves upwards again.

The leaf of June grass is composed of three parts, the sheath, ligule, and blade.

The sheath is smooth and subcompressed, and wrapped around the stem with its edges inflated. When the plants are very young the sheathes are continuous around the stem, but as the plant develops they split lengthwise, the edges overlapping each other. The sheathes act as a protection to the soft growing parts of the stem. Without these the stems would be easily bent over and destroyed. It is beneath the lower parts of the sheath that the stems elongate. The cells of the stem at this place are soft and watery being filled with chlorophyll.

The ligule is truncate and of a white color. It is probably to keep the water which runs down the blade, from getting in between the stem and sheath. It is very thin and contains no chlorophyll.

The blades have parallel sides which terminate abruptly at the end forming a close boat-shaped tip. After a little the growth of the blades takes place at the base where they are joined to the sheath. They grow in the one direction only.



When the blades become dead and dry up, or when they dry out in dry weather, the leaves fold up like the two sides of a book. This folding is due to the action of two groups of bulliform cells, running on the upper surface the entire length of the leaf, on either side of the keel. These bulliform cells are large epidermal cells with their cell walls which are very sensitive to any drying tendency. When this drying takes place, the walls of these cells contract causing the leaf to fold up. This reduces the evaporating surface of the leaves about one-half, so that the plants are better able to withstand the dry wether.

The panicle is open, pyrimidal; the diameter about equals the heighth; rays smooth arranged in half whorls with spikelets den&e on the upper half.

The spikelets are ovate or oblong, from three to five flowers, compressed, rachilla jointed between the florets which are perfect.

The empty glumes are unequal, the lower one about two-thirds as large as the upper one, 1- nerved. The lower one is 3- nerved.

The floral glumes are five nerved with a cluster of silky hairs extending from the base to about one-half the way up the nerve. The middle nerve forms a keel to the floral glume.

There are three stamens with the anthers dehiscent

longitudinally, the styles are two in number, short, terminal, with stigmas feathery.

June grass in some parts of the world, especially in grazing districts ranks very high. When once established it will seldom die out from any of the natural causes. It starts early in the spring, being one of the first grasses to afford a bite to stock. It flowers from the middle of May to the first of June, and ripens about one month later. After ripening it soon dies down and turns yellow. In this condition it is not fit for stock to eat. In the fall when the rains come, it makes a new start, remaining green and growing until the ground becomes frozen in the fall. It grows best on rich calcareous soil where the panicles will be found to be from ten to twelve cm. long, while on light sandy soils they may not be over three to four cm. long. All sizes between these can be found according to the richness of the soil on which the grass is growing.

In some states, especially Kentucky, the late growth of this grass affords food to the stock for most of the winter as here the cattle are not housed and fed during the winter. In shady places it grows comparatively thrifty, but is more spindling than when grown free from shade. When a plant of June grass has a large space allotted to it, the leaves will be shorter and broader. The color will also be much darker and in general the plant is stronger. By putting a

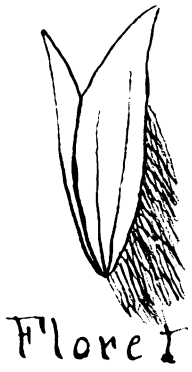
tile over one of the leaves it grew much longer than those not so treated.

The June grass growing on the lawns is most vigorous in ravenes. On the light sandy places it is short and the panicles are very small. In places where the steam pipes pass under the ground, the June grass grew much earlier in the spring. In some of these places the panicles were nearly developed May 5th. This was also noticeable in places that sloped towards the south. By May 11th, the panicles were nearly in flower on all June grass.

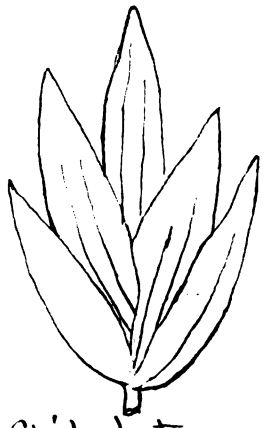
The principle use of June grass in this section of the country is for lawns and pasture. For this purpose it is barely excelled by any of the grasses grown here. It spreads very evenly over the surface, and does not make bunshes as many grasses do. If kept mown and watered it will remain green throughout the summer. For lawns it is sown either in the fall or spring, although fall sowing is considered the best. This is especially true if the next summer is dry, as the fall sown will get a good start before the drought comes on. This will enable it to pass through the drought if not too severe, without being injured. It is a highly nutritious and cattle relish it very much. This is best shown in pasture fields where you will find it eaten close to the ground, while the other grasses may be several inches high. Cattle fatten very fast on it, and the meat is usually of a

fine quality.

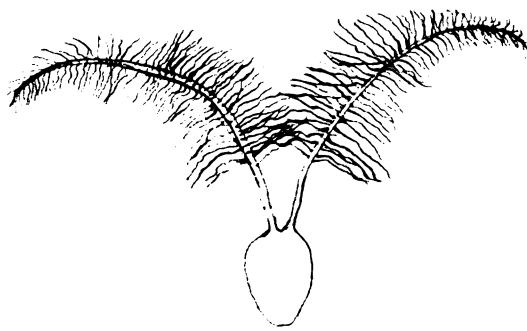
With all its good qualities, it also has some that are not desirable in this section of the country, for it is looked upon by many as a weed. This is because it is so difficult to kill when once established. When plowed under it will soon start a new growth, which will in a few days, with moist weather make the field appear green. Many times after corn is planted if cold wet weather sets in, the June grass will come up to such an extent that the field will appear green before the corn is up, owing to the large amount of growing June grass. If it continues wet this growth of June grass is very hard to kill, and it annoys the farmer very much. It also injures the wheat crop some years by killing the young seedlings.



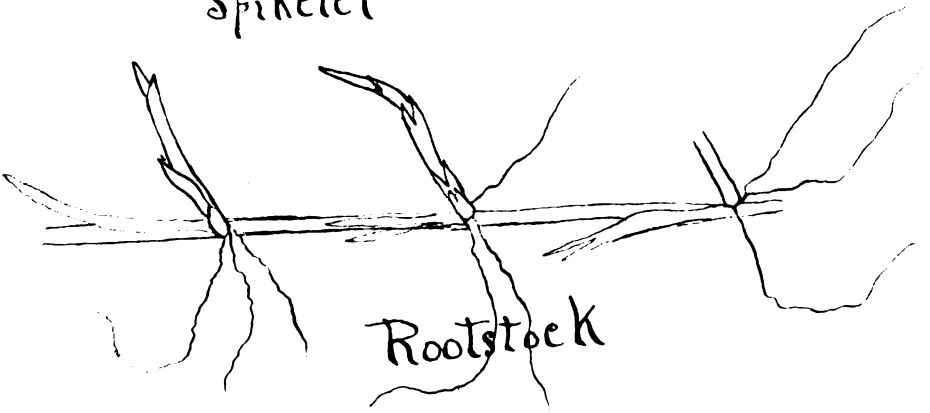
Floret



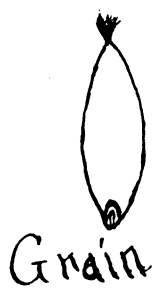
Spikelet



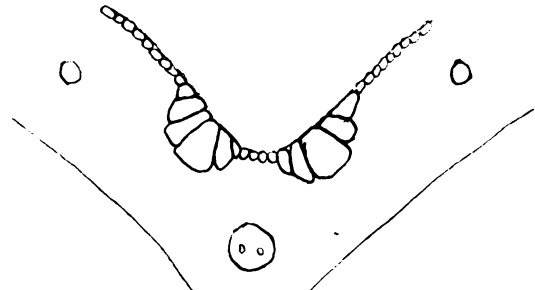
Pistil



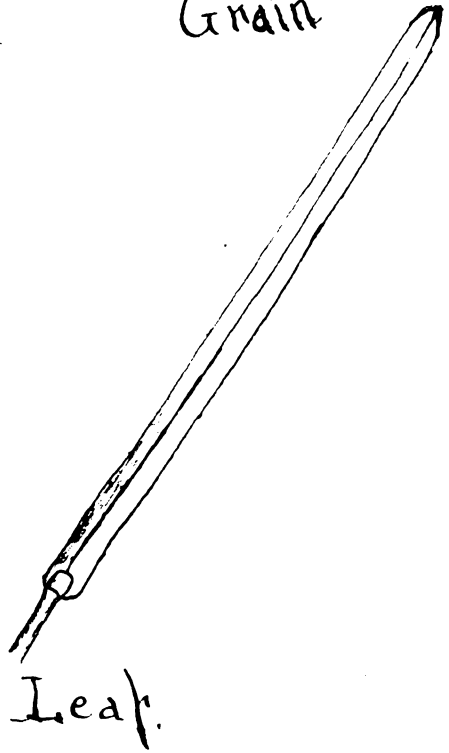
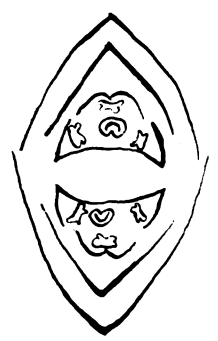
Rootstock



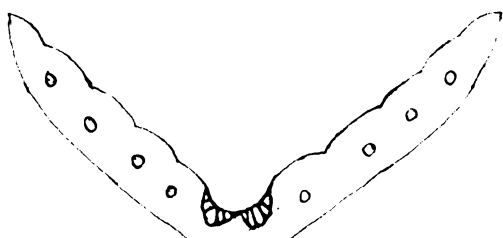
Grain



Cross Section of Leaf
Showing Bulliform Cells.



Leaf.



Section of Leaf

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