SOME SUGGESTIONS AS TO EXPERIMENTING WITH GRASSES.

BY W. J. BEAL.

AS "grass is king among the crops of the earth, and the foundation of all agriculture," the family deserves closer study by the husbandman. The former neglect of the grasses, owing to the great difficulties of learning to distinguish them, leaves a field of great promise, ready for those who are willing to study and experiment, patiently, for many years to come.

1. It will be folly to attempt very many experiments with grasses without they are under the eye of a good agrostologist.

2. Try as many species as possible from every known quarter of the earth, planting in rows three inches apart. Make the plats one by ten rods after they seem to promise usefulness.

3. Scatter the plats as much as possible, allowing none to come next to each other, on account of the liability to become mixed by the scattering of seed.

4. Sow certain combinations of species which thrive well in any place, to compare with each sown by itself.

5. Sow some combinations of grasses which produce no rootstocks.

6. Sow or plant certain grasses, mixed, the species all producing rootstocks.

7. On a variety of soils, in several parts of the country, sow in rows three inches apart, and weed out all excepting grasses, seeds of a large number of species mixed together. Grow these for years, noting the changes that take place.

8. Analyze several species of grasses of the same age and species grown on similar soils; in one case the grasses to be much crowded, in the other, each plant to have an abundance of room.

9. Try to improve grasses by culture and selection, and changing seed. Try some on rich land, with good care, and plenty of room, and compare with the same species neglected on poor soils and crowded. Select seeds of both lots and sow for comparison.

10. Select ground for stations, say in Michigan, Nebraska, Texas and Arizona.

A STUDY OF *POA PRATENSIS*, L.

BY W. J. BEAL.

IN noticing the variations of *Poa pratensis* in my recent studies, I am constantly confronted by this question: Are the variations due entirely to the surroundings as we find them at Agricultural College, Michigan, or to some extent to the seeds from which the plants were raised?

The plants examined were selected in various places in one neighborhood, but as to the source of the seed, I know nothing. If I knew the plants were from seeds of one selected plant, even then I should by no means feel sure that any variation in the products were entirely due to the surroundings and treatment of the soil. With these preliminaries, I will briefly state the results of some studies.

I examined a large number of specimens when in flower or later. From these I selected ten culms in variety, including the longest and the shortest. The mode of comparison is here illustrated by lines.

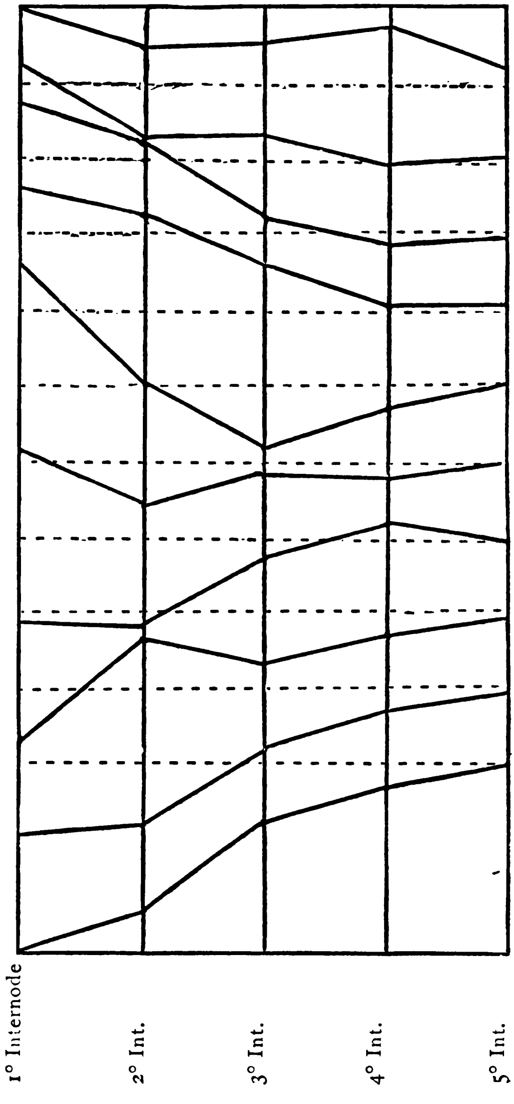

Fig. 1.

Ten horizontal parallel lines, each represents the average of the ten specimens. There are five vertical lines. I do not here illustrate or speak of the stamens, pistils, paleæ, glumes, or grain. I speak of the lengths of the internodes, leaf-sheaths, blades, panicles, width of panicles, length of the longest branch, the total number of spikelets of each plant.

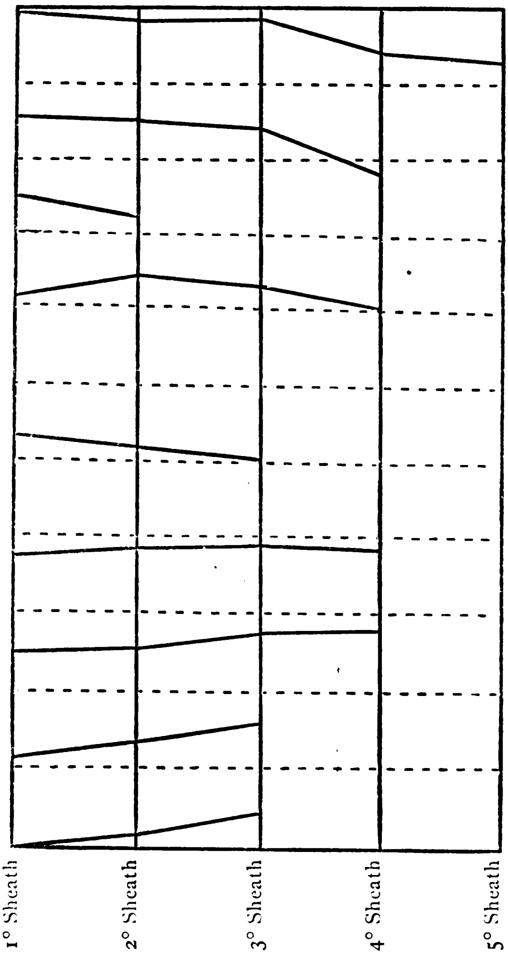

Fig. 2.

The tallest plant grew on good soil near hoed ground, had seven internodes, and was 127 c.m., or about four feet high, and contained 570 spikelets; the smallest had five internodes, was six c.m. or about two inches high, and contained eleven spikelets.

The mode here used to represent the comparison of the plants, I first saw used by A. R. Wallace, the famous English naturalist. Beginning at the left in Fig. 1, I added the figures representing the length of the ten top internodes and took an average. If number one was above the average, as it was, the part and the proportion is shown by putting it above the average; if below the average, the line goes below. In like manner I compare the ten next internodes on the second perpendicular line, and the next below on the third vertical line, and so on.

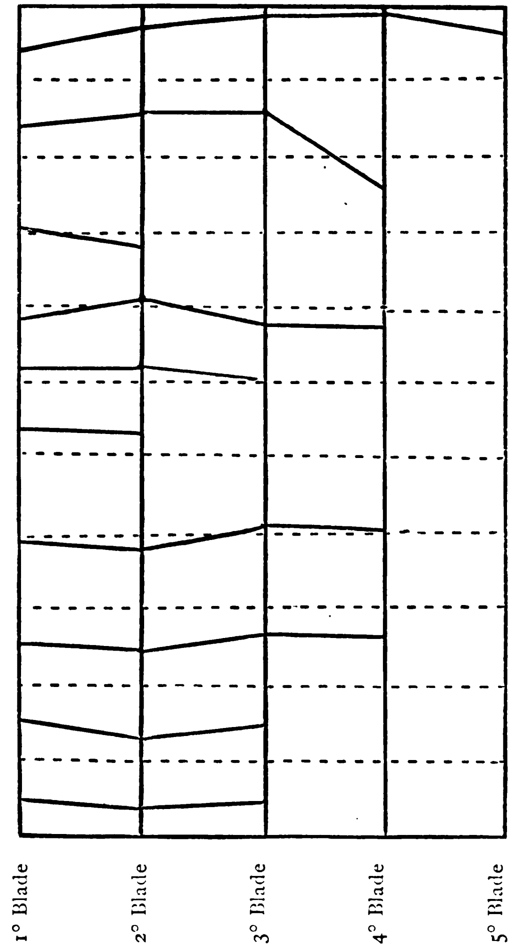

Fig 3.

Let us follow the lines representing the tallest plant clear through. Begin with Fig. 1, on the top dotted line. We see that it runs in a zigzag manner where the internodes are represented, different lines for the sheathes, and still different for the blades, and still different for the panicles. In other words these several parts differ from the medium or average in different degrees. Then trace the second, the third, and any or all of the others. We find of the first or upper internodes, six above the average and four below; of the second internodes, five above and five below; of the third internodes, four above and six below; of the fourth internodes, three above and seven below; the fifth is too short to show well.

Of the first sheath in Fig. 2, there are six above and four below; of the second sheath the same; of the third sheath four above and

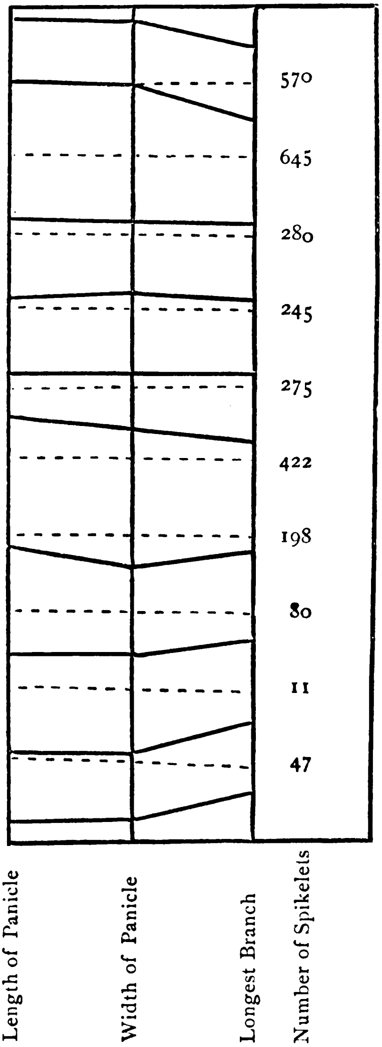

Fig. 4.

Average number Spikelets, 277.3.

four below, and two are not shown. In case of the first blade of a leaf, there are five above and five below; of the second, four above and six below. Of the total length of panicle, there are six above and four below the average. The total width and the proportion of the longest branches are represented by finding six above the average and four below.

Adding the number of spikelets found on the ten plants, we find four above the average and six below. This comparison could probably be carried to other parts of the plant. We could select culms from one plant for comparison with each other, or culms from different plants. We could compare those grown in one locality with those grown in another. By following up this plan, we could learn which parts varied most, which least, and thus learn those characters of most and of least value in defining genera and species.

A DUTY WHICH WE OWE TO SCIENCE.

BY C. E. BESSEY.

To the Members of the Society for the Promotion of Agricultural Science:

GENTLEMEN—Regretting my inabililty to be present at the meeting this year, I desire to present a few thoughts for your consideration. They may be labeled "A duty which we owe to science."

Two years ago I had the honor of presenting a paper in which I discussed some of the demands made by modern agriculture upon one of the sciences—botany; I wish now to turn to the other side of the question and urge the recognition of a duty which scientific agriculture owes to science. This society has for its object the promotion of agricultural science: and I assume that any discussion which may tend to promote the welfare of any of the sciences upon which agriculture rests is strictly within the purpose and scope of this organization.

I have been frequently pained and not a little chagrined when reading or listening to the discussions upon what is called agricultural science, to find that very generally there is a disposition to forget that a science must not cease to be scientific when brought within the domain of agriculture. Chemistry in agriculture must be just as exacting in all of its methods, as it is in the laboratory of the investigator. Entomology whether "economic" or otherwise must be strictly scientific. There must be no sacrifice of the scientific method, in the presentation of physics, or botany, or zoology, when these occur as a part of agricultural science. In other words, there is no such thing as agricultural chemistry, agricultural entomology, agricultural physics, agricultural botany, agricultural zoology, etc., as distinguished from the *science itself* in each particular case. If agricultural chemistry is not scientific chemistry then it is not science at all, and so with the others. Agricultural entomology is identical with scientific entomology, or it is but a series of descriptions and recipes, with no more right to claim the name of science, than have the medical almanacs and other pamphlet publications of quacks a right to claim place in respectable medical literature.