



# Botanical Gazette.

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**Editorial.**—MR. THOS. MEEHAN, in the *Gardener's Monthly* for November, gives a very interesting history of the weeping willow. All sorts of stories about it have found their way into print and it is well to have them corrected.

C. V. NAEGELI, in a recent number (Oct. 14) of the *Botanische Zeitung*, has published a paper on "The Growth of the Starch-grain by Intussusception." It will be read with great interest by all interested in this much vexed question.

DR. DECRESPIGNY, in the last *Science Gossip*, speaking of plants from the Swiss Highlands, says that "Desor reports *Ranunculus glacialis* as growing upon the Schreckhorn at 11,600 feet, *Androsace pennina* at 10,550 feet, and the lichen *Parmelia elegans* on the highest summit at 13,050 feet."

PROF. PFEFFER has published his first volume on the "Physiology of Plants," it being devoted to Stoffwechsel or metabolism. The second volume will be upon "Kraftwechsel," which, Mr. Vines says, is the conversions of latent into kinetic energy and *vice versa* which are involved in the metabolic processes.

A LATE COPY OF NATURE says that Herren Loew and Bokorny find that living protoplasm possesses in an eminent degree the property of reducing the noble metals from solutions, and that this property is lost when death occurs. The discoverers of this fact say: "It may well be inferred that the mysterious phenomenon denoted by the name of 'Life' depends essentially on these reducing atom groups. In the present state of science we explain these 'groups in motion,' these springs of life phenomena, as aldehyde groups, but would by no means exclude some different and better mode of explanation."

DR. ARTHUR MINKS is engaged in a most extensive work. Having established, as he announces, the exact line of demarcation between Lichens and Fungi, he proposes to take them up species by species and show the exact position of each, claiming that many so-called fungi will find a resting place among lichens. This book will be issued in yearly parts, each to treat of at least 200 species. The first volume is to appear this month and can be procured from any bookseller in Germany. The decisive characters employed are based upon the thecae. To quote from the prospectus. "The two organs, the theca of Lichens and that of Fungi, are so essentially different, that they can not properly be compared; for considering their structure and evolution, they with their spores, stand in a more striking contrast than any other in organic nature."

MR. LESTER F. WARD has had a paper published in the proceedings of the Phil. Soc. of Washington entitled "Field and Closet Notes on the Flora of Washington and Vicinity." It is a most exhaustive consideration of the subject and may well serve as a guide in the study of other floras. In a comparison of the flora of 1830 with that of 1880, Mr. Ward makes it appear that over 80 species have actually disappeared from the region in that time, or have become so rare that their stations have not been discovered. If these represent only the observed disappearances, probably the actual number is much greater. A detailed description of localities of special interest to botanists is given and they make one's fingers twitch to be collecting such species as are mentioned. The flowering time of a large number of species has been especially noted as the time in the region studied does not accord with that given in the manuals, being usually several weeks earlier. Second or fall-blooming of vernal species was noted in 17 species, the majority being *Gamopetalæ*. Seven well defined albinos are listed the genera being *Desmodium*, *Liatris*, *Rhododendron*, *Vinca*, *Mertensia*, *Sabbatia* and *Pontederia*. Many tables are given which give statistical views of the Flora from various standpoints. The whole number of species is 1,249, which compares very favorably with the floras of much more extended regions.

DR. WILLIAM SIEMENS during last winter and spring repeated and enlarged upon his experiments of the year before, showing the applications of electric energy to horticulture and agriculture. His previously stated results were largely confirmed, and it seems to be no longer a matter of doubt that electricity will become as important a factor in horticulture as heat and water, whenever its production can be made reasonably cheap. The favorable effect of continuous light is re-affirmed, and plants seem to be able to work unceasingly and the beautiful nyctitropic actions, so elaborately worked out by Dr. Darwin, are more from the absence of light than from the need of rest, and might well be dispensed with if light could be supplied uninterruptedly. Thus development from "the early leaf to the ripened fruit" can go on at a greatly accelerated pace, and not only will the resulting seeds not lose any germinating power but the fruit will gain in size, aroma and color.

PROF. W. J. BEAL has just published an excellent lecture upon "The New Botany," being a consideration of the best method of teaching. The lecture is one that should be in the hands of every teacher of botany, so full is it of suggestions that can be acted upon, even by those who have no laboratory appliances. The whole effort of the method given is to cultivate in the pupil just what many of us have long been struggling after, namely, the ability for original research. No matter what method of teaching botany is employed, if it teaches and stimulates the pupil to observe, it is based upon the correct principle. There may be as many ways of gaining this end as there are good teachers, and every true teacher will leave his own impress upon the method employed. But those who can not originate methods, had better follow

those that have proved most successful, and looking at results, there are few better teachers of botany than Prof. Beal. But he speaks for himself upon another page and gives us not only a synopsis of his own methods, but, what is perhaps just as interesting, a specimen of what they produce.

EVER SINCE INSECTIVOROUS PLANTS came into vogue there has been no end of plant marvels. That wonderful tropical tree which swallowed into its leafy crown any unlucky mortal who came within the circle of its influence has run the gauntlet of the newspapers more than once, but really it represented very well a Broddignagian *Drosera*. The latest phase of this multiform story has just appeared in the pages of a scientific periodical where it is published as credible. It comes this time dignified by the names of officers of the royal navy, and the appetite of the tree has become most abnormal, desiring now only bones which it holds on to with all the pertinacity of a famished dog. The tree observed had the habit of passing the bones tossed under it up to its upper braches, and standing near some native huts every twig was ornamented with its set of bones, the natives evidently not considering it so much of a curiosity as a convenient receptacle for bone rubbish. Indeed, this last story seems not to have lost a whit of the marvels of the first; and its appearance in a prominent scientific journal will give it a fine start in the unscientific press.

**The Asparagus for Histological Study.**—I have for several years been wanting a good Monocotyledon for histological study in the botanical laboratory, one which should be for its sub class what the pumpkin is for the Dicotyledons. The Indian Corn, which is commonly used, is too difficult, and too greatly specialized a type, exhibiting as it does the peculiar nodal structure of the stem of the Gramineæ, rather than the structure of the stem of Monocotyledons in general. A good representative stem, and one which can be obtained everywhere in good condition, from early spring until the end of the season, is the Asparagus. This has been carefully studied the past season in the botanical laboratory of the Iowa Agricultural College, by Miss Fannie J. Perrett, from whose thesis I select the following results :

The epidermis is composed of elongated cells quite regular in outline, and of deep radial, as compared with tangential diameter. The external walls are well thickened. The stomata are abundant, and are regularly disposed. They appear to develop directly from mother-cells cut off by transverse fission from the ends of ordinary cells. It is an easy matter to secure transverse sections of stomata by making repeated cross sections of the stem. Trichomes appear to be wanting.

The hypoderma is composed of collenchyma and parenchyma, the latter being rich in chlorophyll. Beneath the hypodermal tract is a meristem layer, to be more particularly noticed hereafter. The remainder of the Fundamental System of tissues is composed of large and long-celled parenchyma.

The fibro-vascular bundles are closed; that is, they contain, when fully developed, no meristem tissue. In a transverse section



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