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Attention is called to the "Wants" column. All are invited to use it in soliciting information or seeking new positions. The name and address of applicants should be given in full, so that answers will go direct to them. The "Exchange" column is likewise open.

ELECTRO-HORTICULTURE.

IN the winter of 1889-90 experiments were undertaken at the Cornell University Experiment Station, by Professor L. H. Bailey, to determine what influence the ordinary street electric light exerts upon plants in greenhouses. Much has been said among gardeners concerning supposed retarding or accelerating influences of street lamps upon plants. Many have supposed that the electric light can be introduced profitably into greenhouses for the purpose of hastening growth. Still others have supposed the electric lights at exhibition halls to be injurious to plants, and have said that flowers fade quickly when placed near them. The whole subject of the relation of electric light to vegetation should be understood, and wholly aside from any thought of introducing the light into greenhouses, its influence upon plants, both under glass roofs and in the open, is a question which demands careful investigation.

In recapitulating the results of the experiments made, Professor Bailey says, in Bulletin 30 of the station, that it is impossible to draw many definite conclusions from the researches made. The many conflicting and indefinite results indicate that the problems vary widely under different conditions and with different plants. Yet there are a few points which are clear: the electric light promotes assimilation, it often hastens growth and maturity, it is capable of producing natural flavors and colors in fruits, it often intensifies colors of flowers and sometimes increases the production of flowers. The experiments show that periods of darkness are not necessary to the growth and development of plants. There is every reason, therefore, to suppose that the electric light can be profitably used in the growing of plants. It is only necessary to overcome the difficulties, the chief of which are the injurious influences upon plants near the light, the too rapid hastening of maturity in some species, and, in short, the whole series of practical adjustments of conditions to individual circumstances. Thus far, to be sure, more of the injurious effects than of the beneficial ones have been learned, but this only means that definite facts concerning the whole influence of electric light upon vegetation are being acquired; and in some cases the light has already been found to be a useful adjunct to forcing establishments.

The experiments suggest many physiological speculations, three of which may be mentioned. It is a common notion that plants need rest at night, but this is not true, in the sense in which animals need rest. Plants have simply adapted themselves to the conditions of alternating daylight and darkness, and during the day they assimilate or make their food, and during the night, when, perforce, assimilation must cease, they use the food in growth. They simply practice an individual division of labor. There is no inherent reason why plants cannot grow in full light, and, in fact, it is well known that they do grow then, although the greater part of growth is usually performed at night. If light is continuous, they simply grow more or less continuously, as conditions require, as they do in the long days of the arctic regions, or as the plants experimented with did under continuous light. There is no such thing as a plant becoming worn out or tired out because of the stimulating influence of continuous light.

It would seem, therefore, that if the electric light enables plants to assimilate during the night, and does not interfere with growth, it must produce plants of great size and marked precocity. But there are other conditions, not yet understood, which must be studied. The radish plants, and many others, were earlier but smaller under the influence of the light. Observation and chemical examination showed that a greater degree of maturity had been attained. Perhaps they assimilated too rapidly; perhaps the functions of the plant had been completed before it had had time to make its accustomed growth. Perhaps the highly refrangible and invisible rays from the electric lamp have something to do with it. In fact, this latter presumption probably accounts for much, if not all, of the injury resulting from the use of the naked light, for the effect of the interposition of a clear pane of glass is probably to absorb or obstruct these rays of high refrangibility. Good results which follow the use of a globe or a pane of glass show, on the other hand, that the injury to plants cannot result from any gases arising from the lamp itself, as has been supposed by some observers. In the experiments there was no perceptible odor from the gases of combustion; and it may also be said that commercial forcing-houses are not tight enough to hold sufficient quantities of these gases to injure plants.

It is highly probable that there are certain times in the life of the plant when the electric light will prove to be particularly helpful. Many experiments show that injury follows its use at that critical time when the plantlet is losing its support from the seed and is beginning to shift for itself, and other experiments show that good results follow its later use.

HEALTH MATTERS.

Physiology of the Gastric Glands.

ACCORDING to Heidenheim, the delomorphous or parietal cells of the gastric glands — that is, the glands of the fundus — secrete or elaborate the hydrochloric acid of the gastric juice, while the adelomorphous or central cells secrete the pepsin (*British Med. Jour.*). One of the chief arguments advanced in favor of this view rests on the experiments of Swiecicki, who asserted that in the œsophageal glands of the frog pepsin alone is formed, while only hydrochloric acid is formed in the stomach. Fränkel has submitted the statements of Swiecicki to a renewed test. He prepared the mucous membrane of (1) the œsophagus, and (2) the fundus of the stomach of ten frogs, and extracted each separately in two litres of water. To eighteen centimetres of the watery extract of each there were added two centimetres of a one per cent dilution of hydrochloric acid, and a small piece of fibrine. Both mixtures were kept at 37° C. for twenty-four hours; both extracts digested the fibrine. It would seem, therefore, that both the œsophagus and stomach of the frog contain pepsin, or rather, pepsinogen. This would tend to show that in the frog the delomorphous cells secrete both pepsin and acid, for fibrine is digested in the stomach when the secretion from the œsophagus is prevented from entering that organ. Fränkel found that the mucous membrane both of the stomach and œsophagus produced a mineral acid, for both gave the phloro-glucin-vanillin reaction. Contejean finds that section of the vagi does not interfere with gastric digestion in the frog. Electrical stimulation of the peripheral end of the vagus, or of the central ends of the vagus or glosso-pharyn-