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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.

THE ACTUAL NUMBER OF TUBERCLE BACILLI WHICH MAY BE PRESENT IN TUBERCULOUS SPUTUM.

DR. GEORGE H. F. NUTTALL of Johns Hopkins University, in the last number of the "Johns Hopkins Hospital Bulletin,"[1] describes at length a method by which he has been able to make accurate estimates of the actual numbers of tubercle bacilli present in tuberculous sputum. His communication is accompanied by cuts of the apparatus used. The methods heretofore employed for estimating simply the relative number of tubercle bacilli in sputum are condemned as unscientific. Nuttall's observations for the first time give us an idea of the enormous number of tubercle bacilli which a patient may expectorate in the course of twenty-four hours.

In three cases undergoing the Koch treatment observations on the numbers of bacilli in the sputum were made every few days. In the first case the patient expectorated two billions of tubercle bacilli during the twenty-four hours; after the patient was inoculated with tuberculine the number of bacilli rose to three and four billions; after the inoculations ceased the number fell again to two billions.

In the second case the number of bacilli in the sputum varied between twenty and one hundred and sixty-five millions on the days preceding the Koch inoculations, rose irregularly to two hundred and eighty-three millions after the first inoculation, and fell to only two hundred and sixty-five thousand by the time the sixteenth inoculation had been reached. The third case showed a decrease from seventy millions before the inoculations to twelve and nineteen millions after treatment had commenced.

A great rise in the number of tubercle bacilli in sputum was observed in one case (which was not undergoing the Koch treatment) to occur simultaneously with the appearance of elastic tissue. The number of bacilli in this case rose from between three and four hundred millions to over four billions.

[1] A Method for the Estimation of the Actual Number of Tubercle Bacilli in Tuberculous Sputum. With a Note on the General Application of the Method to Bacteriology. By George H. F. Nuttall, M.D., Ph.D. (Göttingen). Reported before the Johns Hopkins Hospital Medical Society, April 6, 1891.

The accuracy of the method is shown by a number of control and culture experiments. Nuttall believes his method will prove valuable in any experiments where it is desirable to introduce a definite number of organisms into culture media, disinfectants, etc. In point of accuracy it far surpasses the loop method generally employed. With such organisms as the tubercle bacillus this method will enable the experimenter to determine the number he is inoculating into an animal in a way that has not been possible hitherto. Inoculations made under such conditions will clearly show the difference in degree of virulence possessed by various organisms, as also the relation between the number of bacteria introduced and the progress of the disease. This method finally brings us a step nearer to solving the problem of the significance of involution and degeneration forms of bacteria.

COLOR-PHOTOGRAPHY.

AT the reading of a paper on "Chromo Photography in Practice," by Leon Vidal, before a recent meeting of the Photographic Society of Great Britain, in London, a collection of photo-mechanical pictures in color was shown, from different countries, and made by different processes. According to the *British Journal of Photography*, the majority of the examples shown were far in advance of anything of the kind produced heretofore.

The journal mentioned goes on to say that the majority of the pictures are produced by methods analogous to ordinary chromo printing processes, inasmuch as different matrices are used for the different colors. The printing plates or stones being made more or less by the aid of photography, as an incentive to experiments in this direction, the journal indicates some of the methods by which prints in color may be obtained, and probably the ways by which the majority of those exhibited were made.

In 1876 M. Ducos Duhauron patented a method which he termed "photographs in colors." His method was to obtain three negatives of the subject, one by green light, another by yellow, and a third by violet light, by means of colored screens; aurine, eosine, and chlorophyl being employed as different color sensitizers. From the three negatives thus obtained prints were made on semi-transparent media, prepared with the complementary colors, and then superimposed on each other. The late Mr. W. B. Woodbury devised a process for producing prints in color. It was this. He made a Woodbury print on paper which had previously had the appropriate colors printed upon it by lithography. By this process Léon Vidal, some years ago, produced some excellent work, and evidently does so still, as proved by the specimens exhibited.

Another plan is to take three or more negatives of the same subject, and then stop out by hand in each certain portions representing the various colors, finally using these negatives to prepare printing plates or stones for successive printings, as in the case of chromo-lithography. By this system chromo-collotypes have long been made.

Messrs. Goupil & Co. have for some years past been producing photogravures in colors in one printing from a single plate. The method is this. The intaglio plate is inked in with different colored inks applied locally as required. This method is a somewhat tedious one, and necessarily requires considerable artistic skill on the part of the printer. Notwithstanding this, the firm have shown many excellent examples from time to time in the exhibitions of the Photographic Society. Instead of applying different colored inks on the same plate, it is obvious that separate intaglio plates can be prepared for the different colors and used for separate printings.

In his paper Léon Vidal alluded to the original method of superimposing a Woodburytype in monocrome on paper printed with suitable colors by lithography, and also treating similarly printed paper by imposing upon it a collotype print, as being the best in practice. He also expressed the opinion that the claims, which had been put forward by some, that the effects of nature could be obtained by the photographic selective character of the negatives

only, without the necessity of retouching or masking, could not be sustained.

One of the cheapest processes of chromo-photography is that of printing from half-tone relief blocks. Several examples by this method were shown in the exhibition. The blocks may be made from different negatives, representing the different colors, as in other processes; or they can all be made from a single negative, afterwards cutting away certain portions corresponding to the colors not required in that particular block.

THE EGG-PLANT.

THE egg-plant seems to have received little systematic attention, either from gardeners or students. Yet it is an important and interesting plant, and there are indications that it can be considerably modified by treatment. This is clearly shown by the results of studies and experiments made at the Cornell University Agricultural Experiment Station, by L. H. Bailey and W. H. Munson, and given in detail in Bulletin No. 26 of that station. Their studies of the egg-plant began five or six years ago, but three years were consumed in learning how to grow it. During the last two years they have grown all the varieties procurable in this country, in France, and in Japan.

The chief difficulty in growing the egg-plant in the North is the shortness of the seasons. It is only by starting plants early and maintaining a vigorous growth that the large sorts can be fruited satisfactorily. The plants should be started under glass from the middle of March to the middle of April in a warm house. The chief cause of failure during the early experiments was the lack of a good forcing house. In the cold and small house at the disposal of the experimenters the plants grew slowly, and when set out of doors they were not of sufficient size and vigor to begin bearing at once. The seed is sown in "flats" or boxes, and when the first true leaves are about half an inch in diameter — which is about a month after the seed is sown — the plants are pricked off into two-inch pots. As soon as the pots are filled with roots, the plants are shifted into four-inch pots. Indifferent success was met with in transplanting into other flats, as the plant is most severely checked when placed in the field, from the greater injury to the roots. It is imperative that the plants should not become "drawn." The plants are transferred from the four-inch pots to the garden from the first to the middle of June. The early sorts are not so seriously injured by a check in growth as the large and late sorts, and they can therefore be handled with less care. These sorts can be started two weeks later than the others and receive but one transplanting. The effects of early and late setting are shown in the following experiment.

Seeds of several varieties were sown March 27 and May 15. On the 7th of September they presented the following differences: long purple, giant round purple, and long white from early sowing were productive, but few or no fruits had formed on the plants from late sowing. Early long purple and round white from the late sowing were fully as productive as those from the early sowing. Early dwarf purple gave best results from plants started April 15. This shows that there is little or no gain in productiveness in the small early sorts from very early sowing, while the large sorts profit by it. The black Pekin, which is one of the large varieties, proved an apparent exception, however. Plants started May 1 gave better results than those started earlier, but neither lot was satisfactory. The unsatisfactory results from the early sowing may have been due to the loss of the first flowers because of the transplanting. Transplanting usually has the effect of keeping plants growing, to the detriment of the flowers; and egg-plants which are in bloom when removed to the field are apt to drop the flowers. It is important in the large sorts to induce the first flowers to set.

The best soil for egg-plants is a heavily manured rich sandy loam, — not too light, — which contains an abundance of humus and retains moisture. The large kinds were set three feet apart each way, although they can be set somewhat closer if land is very valuable. The ground should be thoroughly cultivated throughout the season. The patches were run through lightly with the cultivator at least twice a week.

The worst enemy of the egg-plant is the potato beetle, which prefers egg-plants to potatoes. The egg-plant grows slowly, and any injury to the young plant is overcome with difficulty, if at all. If the plants are seriously injured when first set out there will be little use in attempting to fruit them, especially the large kinds. Paris green, one pound to 100 gallons of water, is used for spraying.

It is rare that all the plants in a large plantation of the common or late varieties mature fruit, and such kinds as black Pekin, New York, and giant round purple rarely mature more than two large fruits to the plant in the latitude of the station, and often only one. The early dwarf purple, early long purple, and other early and medium varieties, mature from four to eight fruits without difficulty. The value of any of the late varieties depends very largely upon the uniformity with which all the plants in any lot set and mature fruit. The value of continuous and careful selection to this end was illustrated in the behavior of a large plantation of crosses last year, in which a large percentage of the plants were entirely unfruitful, showing that a promiscuous lot of seedlings is likely to be unproductive; and in this case these were crosses between productive parents. Breeding plants of uniform productiveness is the most important field in egg-plant experimentation at present.

The results of the experiments may be summed up as follows: (1) Egg-plants are adapted to cultivation in the North. The requisites of success in growing them are these: early starting; warm quarters; vigorous plants; rather late transplanting to the field; warm, rich, and rather moist soil; constant attention to potato beetles; frequent cultivation. (2) The best varieties for private use are early dwarf purple, early long purple, white Chinese, with perhaps black Pekin for late. (3) The best market varieties are New York improved and black Pekin, with perhaps early long purple for the first demands. (4) In crossing different races of egg-plants, the purple-fruited types appear to be stronger in their power to transmit color to offspring than do the white-fruited types; and this appears to hold whether the purple type is used as the staminate or the pistillate parent. (5) The white-fruited types appear stronger in the power to transmit form and productiveness. (6) Fewer seeds are produced by flowers artificially pollinated than by those left to mature, even though an excess of pollen is used. (7) It is probable that the egg-plant may be included among those plants which are capable of producing fruit without the aid of pollen.

As some of the neglect of the egg-plant is doubtless due to the fact that cooks are not familiar with it, the following recipes for cooking the fruits are recommended by the experimenters at Cornell as reliable. (1) Cut in slices crosswise, not over a half inch thick, and parboil in salt water about fifteen minutes; then remove, and fry in a hot spider in butter and lard. (2) Cut into slices a quarter or a half inch thick and lay in strong brine for two hours; then wash very thoroughly; sprinkle with brown sugar, pepper, and salt, and fry slowly to a dark brown. (3) Cut in two lengthwise, remove the seeds and pulp, and fill with dressing made of half a teacupful of bread crumbs, one teaspoonful of butter, and salt and pepper to taste; lay the halves side to side in a dripping pan, add a little water, and bake nearly an hour. (4) Pare, cut in thin slices crosswise, and soak in salt water for eight or ten hours; dry on a towel, dip in beaten egg, and roll in bread crumbs, then fry slowly in hot butter until the pieces become a rich brown; serve hot.

THE LOCUST PLAGUE IN ALGERIA.[1]

ON the 13th of May last I was travelling with my husband through eastern Algeria. At six o'clock on a lovely summer's morning we had taken the train from Algiers, making our way along the shores of one of the most beautiful bays in the world, its blue waters shining in the early sunlight beneath the wooded heights of Mustapha, studded with its white Arab villas. We had left behind us the Maison Carrée, where Cardinal Lavigérie's Pères Blancs make the best of both worlds in manufacturing excellent wines, and in preparing for their life of self-denial in the Sa-

[1] Evelyn Frances Bodley in the Contemporary Review for June, 1891.