

THE FUMIGATION OF FRUIT TREES.

THE systematic way in which fruit crops are protected from insect pests and other natural dangers in California has often been mentioned in these columns. Among the enemies of citrus plants are scale insects, or bark lice, and mites, to the consideration of which an article, by Mr. C. L. Marlatt, is given in the U.S. Year Book of Agriculture for 1900. The natural predaceous enemies of scale insects are various species of ladybirds, such as the Australian ladybird, which was introduced into California to control the fluted and black scales. The black

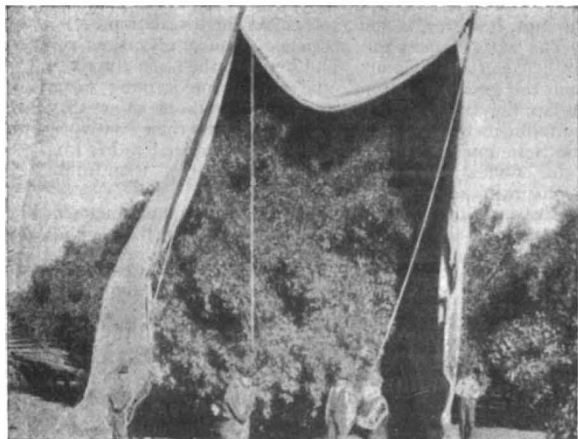


FIG. 1.—Tent carried over tree by the falling of pulleys.

scale has been completely controlled on certain ranches in the United States by its ladybird enemy, and this control has been brought about by the entire cessation of all insecticide operations. But until this condition of things exists on all the ranches, or at least until the natural enemies of scale insects have been fully studied, it is necessary to depend upon spraying and fumigation to keep down the insect pests. The most effective means of doing this is by subjecting infected plants to the fumes of hydrocyanic acid gas. The treatment consists in enclosing a tree at night with a tent as shown in the accompanying illustrations, and filling the tent with the poisonous fumes generated by treating refined potassium cyanide (98 per cent. strength) with commercial sulphuric acid (66 per cent.) and water. The treatment is particularly successful in getting rid

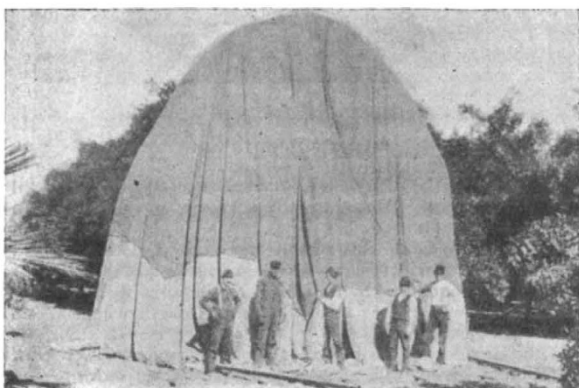


FIG. 2.—Tent in position for fumigation.

of the black scale (*Lecanum oleae*, Bernard) and California red scale (*Aspidiotus aurantii*, Maskell). The tents under which the trees are fumigated are drawn over the trees by means of pulleys, and some of them have diameters of more than seventy feet. To the fruit-grower who leaves things to chance, the work involved in the manipulation of such a protective process may appear excessive, but the cost must be regarded as insurance against loss due to defective crops, and the results obtained in California show that the expenditure of money and energy is fully justified.

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UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

MRS. ANNA HOUGH has offered 40,000 dollars to the University of Southern California at Los Angeles on condition that the balance of 100,000 dollars be raised. The University recently obtained from Mrs. Hough the sum of 25,000 dollars on like conditions.

DR. JAMES MUSGROVE, formerly lecturer in anatomy, was on Wednesday, the 16th inst., installed in the chair of anatomy endowed by the late Marquis of Bute, and instituted under the recent new ordinances in connection with the University of St. Andrews.

UNIVERSITY fellowships, each of the value of 100*l.*, have been awarded at the Victoria University, Manchester, to Drs. E. N. Cunliffe (Owens College) and G. W. Gelderd (University College), both of whom are undertaking research work during the coming year.

IN the expectation of further considerable grants by the local counties authorities, the council of the Birmingham University has, it is understood, authorised the Buildings Committee to prepare plans and specifications for necessary buildings, estimated to cost, without equipment and furniture, the sum of 200,000*l.*

THE following appointments are noted in *Science*:—Dr. J. B. Overton to be professor of biology, Dr. J. H. Hall, assistant professor of physics, each at Illinois College, Jacksonville, Ill., U.S.A., and Mr. F. B. Littell, of the U.S. Naval observatory, has been appointed to a professorship of mathematics in the U.S. Navy.

DR. J. BISHOP TINGLE, instructor of chemistry at the Lewis Institute, Chicago, formerly lecturer in chemistry at Gordon's College, Aberdeen, and at the Merchant Venturers' Technical College, Bristol, has been appointed professor and head of the newly organised department of chemistry at the Illinois College, Jacksonville, Ill., U.S.A.

THE new Municipal Technical College at Sunderland has started with the enrolment of 600 students. This number so largely exceeds the reckoning of the Technical Education Committee that the Borough Council, in order to provide for the necessary increase of the staff, will, it is expected, be compelled to have recourse to its rating powers.

THE dedication of the Severance Chemical Laboratory of Oberlin College took place on September 26, when an address was given by President Ira Remsen, of the Johns Hopkins University. In the course of the proceedings it was stated that Mr. Lewis Severance, the donor of the laboratory, had given the sum of 40,000 dollars as an endowment for the chair of chemistry.

AT a recent meeting of the governors of the Durham University College of Science, Newcastle, the principal of the College submitted his report, in which he stated that the fund for the completion of the College buildings amounted to 31,000*l.* The suggestion of their treasurer, Dr. Hodgkin, that a suitable memorial to Lord Armstrong would be to erect a statue upon some prominent site, and to dedicate the College to his memory, had received the hearty support of Mr. Watson-Armstrong, and was cordially adopted by the council. They resolved to ask the University to consent to a change of name, and to invite subscriptions to an Armstrong memorial fund. A public meeting was held, resolutions were adopted approving of the scheme, and upwards of 20,000*l.* was promised towards it.

SPEAKING at a meeting held on Wednesday, the 16th inst., to inaugurate the third winter session of the London School of Tropical Medicine, Dr. Manson said that the school wished to fulfil two functions, viz., the education of the practitioner who proposed to devote his life to practice in the tropics, and the attempt to advance medical science as regarded tropical disease. How far they had been able to fulfil those undertakings it was for those present to say. As regarded the educational part of their work he could claim that they had had a distinct success although they began with a certain amount of trepidation and anxiety. They had succeeded in overcoming financial difficulties

and professional opposition, the first mainly through the assistance and countenance of Mr. Chamberlain and also with the assistance of the managers of the Dreadnought Hospital. From the first their student attendance was a fair one; but session after session the numbers of students asking for admission had increased, and now the applications were much more numerous than the accommodation they had to offer would allow them to admit. The mere physical space at their disposal was not sufficient to accommodate those who came to study there, and their appeal that day had for its object the removal of that obstacle to their success. The accommodation must be doubled if the school work was to go on. They wanted their laboratories very much enlarged; they wanted a lecture room, a room for a museum, and a good library. All these things were very necessary if the school was to go on and prosper. The work which the students of the school were doing warranted him in appealing for funds on its behalf. As instances of such work Dr. Manson referred to the investigation conducted by Dr. George Low in the West Indies respecting elephantiasis, the work of Dr. Durham and Dr. Myers in Brazil last year, and the new expedition of Dr. Durham to Christmas Island. The English Government, said the speaker, was very niggardly in regard to such matters compared with the German Government. Prof. Koch had forwarded to him, at his request, the following particulars of the subsidies granted to investigators working in connection with medical expeditions sent out under the auspices of the German Government:—“(1) Prof. Frosch in Brioni (Istria), (2) Staff-doctor Bludau in Lussinpiccolo (Istria), (3) Staff-doctor Vagedes in German South-West Africa, (4) Staff-doctor Dempwolf in New Guinea, (5) Staff-doctor Oilwig in German East Africa, (6) Dr. Krulle in the Marshall Islands. Further expeditions to Togo and Kameruns are being planned. The expeditions 1 to 5 have for their collective object, in the first place, the investigation of malaria, and form regular continuations of any malaria expeditions made to Italy, Dutch India, and New Guinea. Expedition No. 6 has for its object the investigation of syphilis and its different forms in the South-Sea Island groups. The European expeditions 1 and 2 receive 20 marks (1*l.*) daily allowance, besides compensation for the various travelling expenses, outlay for the laboratory, &c. The “outside Europe” (foreign) expeditions receive 40 marks (2*l.*) daily, besides compensation for travelling expenses and outlay for scientific objects (books, instruments, complete laboratory arrangements, their upkeep, &c.), with a further 1000 marks (50*l.*) for personal equipment.” The treatment thus accorded to German scientific expeditions was very much more generous than anything done for similar expeditions in this country, and he trusted that the school would receive generous accessions to its funds.

IN distributing the prizes at the Royal Technical Institute, Salford, on Friday last, Sir Henry Roscoe said it had often puzzled him to account for the singular apathy with regard to education which in times past, and to some extent even now, had characterised the average Englishman. Surely one would think that he of all men, dependent as he was for his very existence on his successful solution of problems relating to industry and commerce, would have felt it not merely an advantage, but an absolute necessity, that his knowledge and training should be as perfect and widespread as possible, just because the arts and trades which he practised had their foundation in artistic or scientific principles, and could only flourish satisfactorily under the guidance of those principles—that was, under educated effort. Whilst other countries—notably Scotland, Germany, the United States, Switzerland and France—long ago established their national system of schools, England up to 1870 was without one. Whilst Italy, Scotland, Germany and France in earliest times founded Universities which had remained as Universities of and for the people, the older Universities of Oxford and Cambridge had gradually become mainly high schools for privileged persons, and ceased to do for England what the Scottish Universities did for Scotland—that was, to be the Universities for all classes of the population, rich and poor alike. It must be the aim of the reorganised University of London to do for London's six or seven millions what the Scottish Universities had done for four millions of Scotsmen, and to become a real University for the people. England, however, was awakening. A new era in the history of English education began, first, in the foundation of the local University colleges, and, secondly, in 1890, in the passing of the Local Taxation (Customs and Excise) Act. The fact of the allocation of a sum

of upwards of 750,000*l.* to technical and secondary education was an event unparalleled in the financial history of this country, and was in itself a proof of this awakening. That this act of the Government was appreciated was shown by the fact that the local authorities generally at once availed themselves of the opportunities thus presented. No less than upwards of 3,000,000*l.* had been expended by municipal and local authorities in providing technical schools throughout the land. Moreover, this progress had been unchecked by reverses or by waning interest; on the contrary, it had been continuous, universal and rapid. Still, much remained to be done. “Organise your secondary education” had been the cry from Matthew Arnold's day to our own. Yet nothing had been done in this direction by Parliament, with whom the duty lay. It was true that beginnings had been made; local authorities in some instances—and here he must name those of Manchester—had taken the matter into their own hands and had realised how necessary it was to consolidate and coordinate the education of various kinds existing in their midst, and actually had done so in advance of national action. The country had, he thought, made up its mind and would back any sensible plan for putting this part of our educational house in order. Let them unite in urging immediate action. Let them be satisfied with one thing at a time. If they saw that to put forward and to carry a measure which would bring about that which all desired—namely, that the various forms of educational effort should be organised as one compact whole—was at the present moment beyond the range of practical politics, let them not fail to secure the organisation of a part. This seemed to him to be common sense.

ON Tuesday last Mr. R. B. Haldane, K.C., M.P., delivered an address at University College, Liverpool, on “The Function of a University in a Commercial City,” in the course of which he compared the position of education in this country with that in others, notably in Germany. Throughout the industrial world of Germany they found science applied to practical undertakings by men who had learned, if not in the Universities and high technical schools, at least under teachers produced by those institutions. This was true of a multitude of trades. In electrical engineering, in the manufacture of chemicals, in the production of glass and of iron and steel, and of many other articles for which Britain used to be the industrial centre, we were rapidly being left behind. A striking case was that of the aniline colours discovered and first produced in England and manufactured out of English coal tar. The industry had almost wholly shifted to Germany, although the dyers in this country were the largest consumers. The reason for this was that in Germany the manufacture had been fostered by research in the University laboratories and by careful teaching in the technical schools, with the result that great producing institutions, such as the Badische Anilin Fabrik, had an endless supply of directors and workmen trained in a fashion which we had not the means to imitate. But the school was in Germany by no means the only point at which the professor came to the aid of industry. Too little was known in this country of the type of institution sometimes called the “Central-Stelle,” which had no parallel among our business men. This establishment, which was maintained by subscription at a cost of about 12,000*l.* a year, was presided over by one of the most distinguished professors of chemistry in the University of that city, with a staff of highly-trained assistants. To it were referred as they arose the problems by which the subscribers in their individual work were confronted. By it was carried on a regular system of research in the field of production of explosives, the fruits of which were communicated to the subscribers. The great manufacturers were in constant communication with the establishment, in which they took the keenest interest. In this country, it was needless to say, there existed nothing of the kind. And yet we had to compete with the Germans, not only at home, but in such important markets for explosives as South Africa, where their use was the life of the huge mining industry. Proceeding, Mr. Haldane alluded to the German academic institutions and compared them with the University system of this country, and made a number of suggestions which, if carried out, would, in his opinion, tend towards a better system of education and be for the benefit of the country. The conclusion of the whole matter, said Mr. Haldane, seemed to be that we could establish in Great Britain and Ireland a system of teaching of a University type, with the double aim of the system of Germany, and that without injury to quality in culture.