THE RÔLE OF CHEMISTRY IN FORESTRY*

DR. KRISHNA'S broad survey of the rôle of Chemistry in Forestry was designed to focus attention on the "Vast forest wealth of India which has, hitherto, been only partially utilised for the industrial development of the country" and "the part a chemist plays in developing and exploiting" this wealth. Soil factors and plant nutrition present problems to the chemist ranging from soil productivity to plant hormones. The chemist is also of help to the botanist in identifying doubted species; a striking practical application of such assistance was provided in the cultivation of *Artimesia maritima*. In Forest conservation and protection, the fight against the insect pests which cause untold damage is only possible with the co-operation of the chemist, who has placed in the hands of the entomologist several insecticides, both natural and synthetic. But, it is in the field of utilisation that the rôle of Chemistry is far more varied and extended than in either sylviculture or conservation. Wood is the most important Forest produce. The chief limitation of timber is decay and scientific research has been specially directed to remove this defect. The chemist has made great contributions to the solution of this problem, although the ideal timber preservative has yet to be discovered. Again, the technique of plywood and laminated core construction is entirely dependent on satisfactory glues being evolved by the synthetic chemist.

While the contributions of the chemist in the utilisation of timber have been so diverse, his rôle in the economic utilisation of "Minor Forest Produce" covers a still wider field. The use of the terminology "Minor Forest Produce" is rather unfortunate, tending as it does, to obscure the very great value—both actual and potential—of this group of the forest harvest. "Minor Forest Produce" is at present the cinderella in the realm of forest utilisation. On their own merit, M.F.P. deserve greater care and attention. The objection that the collection of M.F.P. is expensive and undependable, is not insurmountable. There is ample material to be worked up on a "cottage industry" scale. For the proper utilisation of M.F.P., the chemist has to solve the problems on the best and most economical method of extraction of the active principles, the study of the chemistry and constitution of the constituents, questions of drying and storage and many other related problems. The utilisation of bamboos and grasses for paper pulp, the distillation of turpentine from *Pinus longifolia*, of sandalwood oil and to a smaller extent of other essential oils, have been rendered possible by the chemists' activity. Apart from extending this activity, even to retain existing markets requires continuous chemical research to better methods, improved yields, grades and maintain consistent quality. Even what appear at present to be monopolies are not immune to the onslaught of competitors as many Indian products bear testimony. There are large numbers of other raw materials for the production of essential oils, and also, oil-bearing seeds which have yet to be investigated. The same remark applies to tanning materials which add their quota to forest revenue.

India abounds in innumerable medicinal plants and herbs. Most of these drugs, though used from time immemorial in the indigenous systems of medicine, do not find sufficient recognition because correct knowledge regarding their potency, active constituents and pharmacology is still lacking. Of the few that find recognition in the official pharmacœpeas, the wasteful and uneconomic method of exporting the raw material itself prevails. India possesses a variety of soils and climates and, therefore, could easily cultivate and acclimatise a variety of herbs and plants of economic value. Cinchona has thus been introduced into India. Pyrethrum and Derris provide other examples, the former having been introduced as an exotic to Kenya, where it has acclimatised itself. In general, the condition of the drug trade in India is unsatisfactory. Some of the difficulties in the way of manufacturing drugs in India can only be remedied, if a regular supply of genuine raw materials of proper quality is assured. Special organisations have been set up for this purpose in many European countries and valuable services have been rendered by such organisations in stimulating cultivation and improving the quality of drugs and the general standard of trade in their respective countries. It would perhaps be advantageous if such an association were to be formed in India also. It is not too early to begin.

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* Summary of Presidential Address,—by Dr. S. Krishna, Chemistry Section—Indian Science Congress, Madras, 1940.