

## POST-WAR ORGANISATION OF LAC RESEARCH.

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(Read at Symposium, September 27-28, 1943.)

The Indian Lac Cess Committee is a statutory body empowered to take steps to improve the cultivation, manufacture and marketing of lac. The necessary funds for undertaking these measures are found from a cess imposed on all exports of lac.

At present the Committee runs a research institute at Namkum near Ranchi and a research bureau in London. The activities in Namkum embrace entomological, biochemical, physical, organic and applied chemical researches. The London Bureau is maintaining contact with industries through an enquiry officer, is running a chemical laboratory for fundamental and *ad hoc* researches, and has deputed a chemist to carry on research at the laboratories of a firm of electrical equipment manufacturers.

The results so far achieved by the investigations are the improvement of cultivation by new cultural practice and demonstration of such methods to cultivators, development of modified lacs suitable for the preparation of moulded articles (both compression and injection methods), laminated boards, plywood, waterproof abrasive cloth and papers, grinding wheels, anti-gas fabrics, glass substitutes, oil-cloth, bookbinder's cloth, imitation leather, recording discs, oil-varnishes, enamels, etc. etc.

Many lac-consuming industries have been started in India under the stress of the present situation and their post-war existence would necessitate improvements in processes and materials.

Organisation of post-war lac research would comprise expanded scope of investigations for the improved cultivation of lac, biochemical and plant physiological work on lac-hosts and lac secretion, fundamental organic, physical and applied chemical studies on lac and *ad hoc* researches for the better utilisation of lac, and new resins based on lac, in various industries.

### APPENDIX.

#### A NOTE ON PLASTICS.

The outstanding importance of plastics, both natural and synthetic, in modern industries and arts need not be emphasised, especially at a time when metals are too useful otherwise to be used for ordinary purposes. Further, plastics have not only substituted metals, but have here and there improved upon them. One can get an idea of the magnitude of this industry when it is mentioned that the pre-war figure of 200,000 tons of synthetic plastics has been greatly exceeded during the war, and its demand for immediate war purposes is such that most of the civilian needs have been brushed aside. So is the case with lac, the unique natural plastics; practically the whole of its production of nearly 50,000 tons annually is being used for war purposes, the civilian requirements being extremely restricted, and the demand continues. It is noteworthy that whilst in pre-war days only about 2% of the total produce of lac was consumed in India and the rest exported, at present nearly 33% of the lac is being utilised for the manufacture of various war materials like anti-gas fabric, adhesives, moulded products, etc. In spite of the very rapid development of synthetics, lac has maintained its place in most industries where it was used before and is, in fact, entering into newer fields through recent intensive researches carried out under the auspices of the Indian Lac Cess Committee, the Board of Scientific and Industrial Research, and the Indian Institute of Science, Bangalore. From the national point of view, with synthetic plastics as yet a product of foreign countries and used only in small quantities, the stabilisation and improvement of the lac resin is undoubtedly an important problem. But as the by-products of industries that are already in existence in India and those yet to come from future basic industries will assume

a magnitude, their disposal will become an imminent problem for the sake of the basic industries themselves. The synthetic plastics industry, which in many instances depends on chemicals derived from by-products of other industries, will, therefore, necessarily force its appearance as India extends her range of chemical industries. Not only this, chemical industries themselves will arise to produce synthetic plastics if the quantity in demand of the latter is in excess of what the by-products can supply. One can illustrate this: Phenol is a by-product of the coking industry and methyl alcohol was so long a by-product of the wood-distillation industry. When bakelite was produced in the laboratory, these two industries came to be requisitioned for phenol and formaldehyde. But as the demand for bakelite increased by leaps and bounds, benzene, also a by-product of coal distillation like phenol, was converted into phenol through chlorobenzene on the one hand and cheaper and more plentiful methyl was synthesised from carbon monoxide and hydrogen on the other. Thus, with the growth of chemical industries (including electro-chemical and electro-thermal), the synthetic plastics industry will be on the rise, and India which has this unique natural resin lac, that was and is still catering to the whole world, will have to adjust its plastics problem in a manner different from those countries where there are no natural plastics of any consequence. There is another factor for consideration: What is the economic position of lac with regard to synthetics as produced in India or abroad? That the price of shellac has varied from Rs.12 to Rs.250 per maund according to world situation, only indicates that there is sufficient demand for shellac, and its demand could be increased with improvement of certain properties which some synthetics possess. This important industry, which has an average annual export value of 4-5 crores of rupees over twenty-one years, gives bread to 3½ lakhs of cultivators in Chotanagpur alone, and as lac cultivation occupies the cultivators for a fortnight only in the whole year, its competitive capacity against synthetics can be gauged. As mentioned above, the improvement of certain properties of lac, therefore, would open up such wide range of applicability that the synthetic resins may have to play a secondary or a complementary rôle for some time yet in this country. Thus, researches on lac are both necessary and desirable. For modifying lac to render it suitable for such performances as synthetics are able to, the idea of taking help of synthetics themselves is not unsound. Even today, several synthetic plastics and varnish products use appreciable quantities of lac for improving their quality. The problem would be to reverse the order, that is to say, to improve the quality of lac by the addition of or reaction with smaller quantities of chemicals or synthetics. With the complete knowledge of the constitution of shellac, which as yet is wanting, it could be degraded or polymerised so that it may be an important starting material for producing synthetics of special quality. It behoves, therefore, that in the post-war reorganisation of lac research, a study of the modern synthetic resin problem in relation to the former should not only not be overlooked, but a closer liaison between the two should be established, particularly as the lac industry is an already well-organised industry of the country. Indeed, a composite plastics research laboratory, where both natural and synthetic resins are investigated in all their ramifications, with a special bias towards the natural resin, lac, and proper co-ordination with researches on synthetic resins, would appear to be desirable. The National Research Council, if it comes into existence, could be of considerable help in co-ordinating both sides of the problem and evolving a national economic outlook.