

Discussion and Recommendations on the foregoing Paper

BY

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The report on the examination carried out at the laboratories of the London Advisory Committee and by the India Rubber Manufacturers' Association on rubber from latex coagulated with sulphuric acid and supplied by the Rubber Research Institute, is very opportune. It confirms many of the statements made in the paper on this subject already published in this Journal by one of us (J.L.W.) and offers an opportunity for some general remarks on the situation.

The previous paper was written in October 1932 and published in the Journal in December 1932 [*J.R.R.I.M.* 4 (1932) 94]; since then various remarks in the press and in correspondence addressed to us have shown that many commentators have formed an incorrect opinion on the views expressed in that paper. It would seem to be believed in some quarters that the Rubber Research Institute has deliberately recommended the use of sulphuric acid as a coagulant with a fine disregard, or in complete ignorance of the possible repercussions of such a recommendation. It is therefore necessary to refer to the conditions under which that paper was published and, briefly, to its subject-matter.

In October 1932 the price of rubber was 7.48 cents per lb. and at the date of publication, December 1932, it was 7.61 cents per lb. The price showed no indication of recovery and the vast majority of rubber producers were working at a loss. Work at this Institute was therefore of necessity directed to some extent into a search for methods of reducing costs and the provision of relevant information to any producers desirous of experimenting with various methods. In these circumstances the possible use of a cheaper coagulant could not be overlooked and there were many enquiries as to the desirability of using sulphuric acid which had previously been used in times of acetic acid shortage. The object of the paper was to circulate more widely the views expressed in our advisory correspondence and to adduce confirmatory experimental evidence.

The paper opens with a brief summary of published literature; it continues with a description of experiments designed to show the optimum conditions for coagulation; further experiments are then reported to prove that rubber produced under these optimum

conditions is satisfactory in relation to those tests which it was possible to carry out in this laboratory. The saving effected by the use of sulphuric acid was estimated at 0.05 cent per pound.

It was also pointed out that, in some quarters, there would be opposition to the marketing of rubber prepared by the use of sulphuric acid sheet. It was suggested that estates wishing to adopt this coagulant should first submit samples of the new product in the normal market. To stress the marketing difficulty the warning against sulphuric acid issued by the Rubber Growers' Association in 1926 was quoted in full. Against this warning two arguments were advanced (a) that a saving of 0.05 cent per pound was of infinitely greater importance in 1932 than in 1926, (b) that the use of sulphuric acid in minimum quantities would not increase very greatly the considerable degree of variability already existent in plantation sheet rubber.

The last paragraph of that paper gives the key to the position as envisaged by the Institute at that time and is quoted in full:

"It is impossible for us definitely to recommend the use of sulphuric acid, since the varying requirements in different markets render the problem as much commercial as technical. It is possible to produce a good quality rubber by the use of sulphuric acid, provided sufficient care is exercised, but even the best rubber thus produced may prove unwelcome if it falls into the hands of a buyer who has a fundamental and longstanding objection to the coagulant."

Correspondence with kindred organisations in Ceylon, Sumatra and Java reveals the facts that in Ceylon no estates have so far used sulphuric acid and that in the Dutch East Indies only one or two estates use it. The various notes of warning, which were sounded in the previous publication from this Institute, are similarly sounded in the Dutch East Indies by the organisations concerned, and the few estates which use the acid do so not with deliberate encouragement but in the full knowledge of the difficulties and complications involved.

At the present time (April 1934) the only change in the position is the increased price of rubber, and this affects the position materially.

The present report by Messrs. Martin and Davey reveals no technical objections to the use of sulphuric acid except a slight increase in time of cure and this fact in itself would not seem to be of very vital importance. The authors in discussing the experimental results say "The effect of the sulphuric acid, when used "in correct proportion, is very small when compared with the "total variability which already exists. The rubber from some "estates using formic or acetic acid as a coagulant may vulcanise

"twice as fast as that from others using the same coagulant, "whereas the retardation of vulcanisation owing to the use of "sulphuric acid is less than 20 per cent. and may in some cases "be much less." It is, however, the opinion of the authors that "the use of sulphuric acid would tend to increase the variability "in vulcanisation of first-grade rubber unless its use became "general."

The report, as a whole, and particularly the section contributed by the India Rubber Manufacturers' Association, makes it clear that the use of sulphuric acid is not welcomed at present; the experimental results reveal no really objectionable features, but it is felt that there may nevertheless be unsuspected disadvantages in cases where a manufacturer received a supply of rubber without being aware of the fact that sulphuric acid had been used in its preparation. From the producers' viewpoint therefore the outstanding feature is that there is not a universal acceptance of sulphuric acid coagulated rubber and as in 1932 so in 1934, it is "impossible for us definitely to recommend the "use of sulphuric acid since the varying requirements in different "markets render the problem as much commercial as technical."

It is believed that none of the comparatively few estates, which adopted the use of sulphuric acid as an emergency measure, did actually take the advice of the Institute and submit samples of the product in the normal market; rather did they market the rubber through the usual channels without indicating the nature of the coagulant used in its preparation. In this they followed the example set by a few estates on which sulphuric acid had been in common use for many years previous to the period of depression. These producers have been able to sell their product at top prices for many years, have received no complaints on the quality of the rubber and have at no time been called upon to declare the nature of the coagulant used. During the past two years the use of sulphuric acid has probably increased slightly but we have received no reports of poor quality or deterioration in storage of the rubber prepared in this manner. In view of the fact that no broker or other buyer appears to demand a certificate of preparation, estates have not generally accepted the suggestion of the Institute and have marketed the rubber without giving an indication that sulphuric acid was used in its preparation. Consignments of rubber reaching England are assumed by the manufacturer to be material prepared by the use of acetic acid or formic acid unless otherwise stated, and it is not difficult to understand the uneasiness which arises in the mind of the manufacturer at the thought of receiving unknowingly a consignment which might not in fact consist of one of those types of rubber to the

processing of which he is accustomed, and with the peculiarities of which he is by experience aware. It is perhaps regrettable that there exists no system of declaration under which producers would be called upon to certify the nature of the coagulant used in the preparation of each consignment; neither the broker nor the user, who is most nearly affected, appears to press for such a system which would at once relieve the uneasiness in the mind of the user, and in the long run the more quickly establish firmly, or on the other hand completely and finally dis-establish, any type of rubber of which users had not had experience. It should be remembered that, while the Institute can give technical advice, and while it can bring new products to the notice of some users, it is powerless to overcome a natural aversion of users as a body to the adoption of a material prepared in an unusual manner. In order to overcome such aversion the user should be given an opportunity to buy the certificated article and test for himself at leisure its suitability; thus and thus only can the article make for itself an assured market. If sulphuric acid rubber is to establish itself in face of the doubts and fears, which rightly or wrongly exist in the minds of users, it can never properly do so by a perpetuation of the present method of marketing which, if it does not encourage, certainly does nothing to deter an estate from marketing a product which the user buys assuming it to be a different product. If the product be similar in its properties to rubber prepared by the use of formic acid or acetic, this fact will in no way alter the user's fear of sulphuric acid sheet rubber for he will not be aware that he has ever had it.

In the absence of a system of declaration rubber prepared by the use of sulphuric acid has at the present date neither general acceptance nor a mass of technical testimony based on large-scale practice to condemn it.

The new technical evidence now presented, although obtained in small-scale tests, actually serves to strengthen rather than to refute the views expressed in the previous publication, that a rubber of good quality can be produced by the intelligent use of sulphuric acid.

The welcome improvement in the price of rubber has however now made it less important to seek economies of the order of 0.05 cent per pound of rubber. Because of this fact and of the uneasiness which the undeclared use of sulphuric acid may create in the minds of users, the few estates which are using sulphuric acid are advised not to continue this method of preparation without declaring the fact to the purchasers of their product.

Kuala Lumpur,

25th April, 1934.