

# THE MOSAIC SITUATION IN NATAL

(Paper By H. H. STOREY, B.A., Government Mycologist, Durban.)

It is my intention to give you only a brief summary of the progress which has been made in regard to mosaic disease control. For it would appear that the principle of the eradication policy, which I first put before you a year ago, has now been generally accepted by the Sugar Industry.

It will be remembered that it was decided that the opinions of certain sugar cane pathologists in other countries should be obtained before my suggestions were adopted. I believe the letters of these gentlemen are to be placed before you. I will merely say that they entirely endorse my views and express full agreement with my proposals. Dr. Earle writes: "I am in complete accord with all his recommendations . . . You have a good opportunity to free your district cheaply from this insidious and destructive disease." Dr. Brandes: "Without attempting to minimise the expense of carrying through such a plan, and with a realisation that there is a certain element of chance in its success, I would say that the project should be undertaken, in view of the tremendous advantage which would be enjoyed by Natal if it were successful."

I do not propose to dwell upon this aspect, for I think there is now almost a unanimous opinion upon the importance of action, and further argument is unnecessary. But, in that the soundness of my scientific judgment has been questioned, I feel that I may probably be forgiven for insisting that my recommendations have been endorsed by the two sugar cane pathologists who have had the greatest experience in mosaic disease control. I may say that my decision to recommend the eradication was not taken without realisation of the difficulties and the chances of non-success. I however undertake the responsibility of advising this policy by reason of the great advantages that it would afford, if successful, and the great dangers of the situation if left to take its course. This is exactly the attitude of Brandes; that the chances of success are good and in any case worth taking.

An important sentence occurs in Dr. Brandes' letter. "It has been our experience in dealing with these outbreaks (of mosaic) that almost invariably no attention is paid to the control of this disease until it is beyond control. When the disease is beyond control, it calls for a period of long expensive reorganisation of the industry." I believe that in Natal control is not only possible but is going to be proved successful; but with what would have been

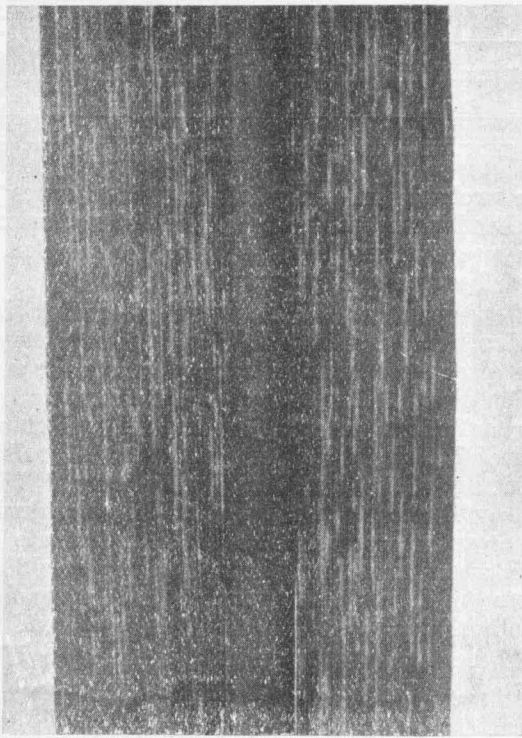
the probable extension of Argentine canes, Agaul and Soft canes on the flats, it is not unreasonable to suppose that in years to come the problem might have become beyond control.

However, that is all matter of historic interest, and with a unanimous determination to eradicate the disease we have now to overcome the practical difficulties. A Proclamation has been drafted (under an existing Act of Parliament) which will require the ploughing out of all cane-stools of all varieties other than Uba, by January, 1925. This date will allow the reaping of the crop during the forthcoming season. That will necessitate in certain cases the cutting of cane at one year old, but the quantity is so small as not to justify the delay of another year.

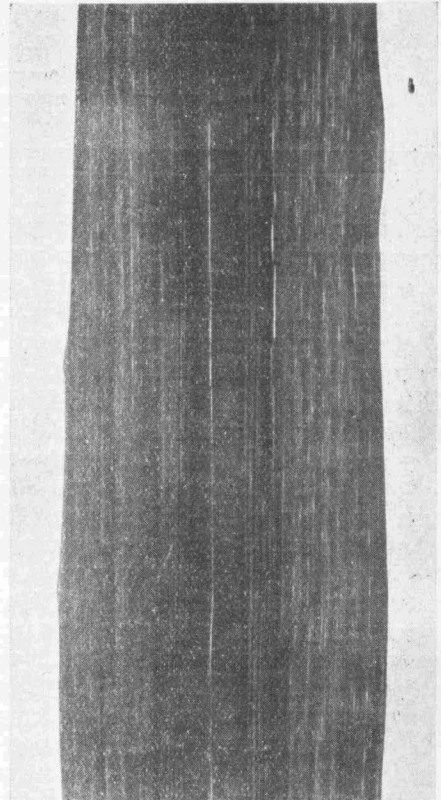
The category "all varieties other than Uba" includes all sweet canes, Argentine canes, China and Agaul, but not the brown striped variety of Uba. Special reference must be made to Agaul, concerning which I regret that I have made conflicting statements. At the last Sugar Week I was asked whether this variety was susceptible to mosaic. On the strength of one single observation, and the obvious close relationship of this variety to Uba, I suggested that it also was probably immune. This view is incorrect. With certain exceptions, all the authentic Agaul that I have seen has shown some disease. Indeed I have once or twice found what appeared to be mosaic diseased Uba, but in each case enquiries showed that the cane had been received from Winkle Spruit and was undoubtedly Agaul.

The exceptions to which I referred occur at Umlhali. There are two lots of cane there which were separately received from Winkle Spruit; neither now shows any mosaic. At one time I suspected that this cane was in fact Uba (from which it is indistinguishable upon any botanical characters) but recent analysis figures appear to disprove that. The question of the identity of that cane therefore must remain in abeyance; I am endeavouring to transmit mosaic to samples taken from the plots there. But in general, Agaul may be taken to be susceptible to mosaic and therefore included with the varieties to be destroyed.

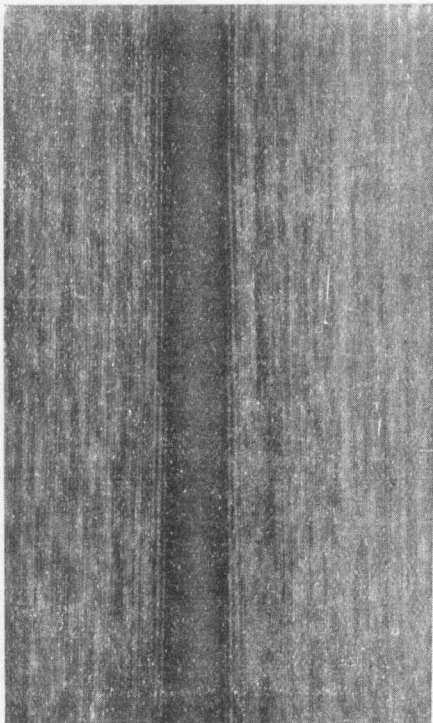
This Agaul question is a most important one. For it is cane that the most careful examination will fail to differentiate from Uba. The only certain means of knowing it is to know the history of the



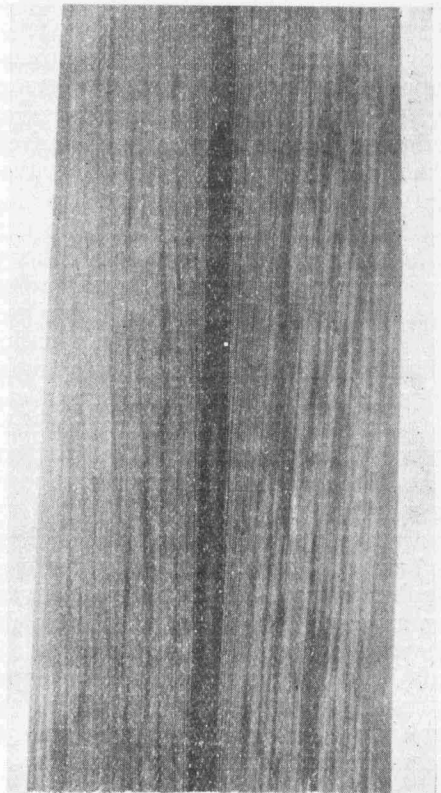
1a A portion of a leaf of Uba affected with *Streak* Disease. Magnified 2 diameters.



2a *Streak* Disease in Green Natal (Rose Bamboo). The central white line is a split in the mid rib. Natural size.



1b A portion of a leaf of Argentine III. showing *Mosaic* Disease pattern. Magnified 2 diameters.



2b *Mosaic* pattern in Green Natal (Rose Bamboo). Natural size.

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getting today was very remarkable. The fact re-particular sample. I therefore urge all who have ever received cane from Winkle Spruit to locate the plantings from it most carefully. If Agaul should become mixed with Uba to any considerable extent all our attempts at mosaic control would be frustrated.

The Proclamation will, then, require the destruction of all cane stools by January, 1925. The Department of Agriculture will place at my disposal the necessary inspectoral staff to ensure that Indian and native cultivators conform to the general scheme. But for the European-owned estates we must depend largely upon the loyalty of the individual planter. I must insist that not one stool of susceptible cane must be allowed to remain. The odd stool in the kitchen garden would remain as great a menace as the large areas of cane.

I ask your assistance in locating these odd stools, which certainly represent one of the great difficulties of the problem. We have already located four hundred and ninety Indians owning between them under forty-five acres, and we shall continue to search out every stool. But obviously your own co-operation is essential, particularly in regard to small patches of sweet canes, which are hidden by Uba, and to possible volunteer plants from old stools imperfectly ploughed out. Such old stools if left would be liable to negative the success of the whole campaign, and I cannot too urgently impress upon you the need for vigilance in this regard. Furthermore the ploughing must be repeated as often as is necessary to ensure complete destruction of the old stools. In the case of Argentine canes, no planter must be satisfied until it is certain that every stool is dead.

The promulgation of this Proclamation is dependent upon one other point; the question of compensation. I am not authorised to make any pronouncement upon this matter, but I believe that the Department requires to be assured that it will not be met by large claims for compensation from European planters. I do not propose now to recite arguments for the reasonableness of this attitude, but I must remind you that in providing inspectoral staff and undertaking what compensation of Indian growers is necessary, the Department is bearing a considerable proportion of the expense of the eradication scheme. Anyhow I merely put it to you now that claims upon the Department for compensation will inevitably delay or even prejudice the issue of the Proclamation.

One other point remains—the maintenance of a stock of the cane varieties which have given promise of successful cultivation. I hope that the Experiment Station will be able to undertake this work. It will be a perfectly feasible thing to maintain such stocks of cane mosaic-free with adequate precautions. I already have a healthy plot of Argentine cane growing at Umbogintwini, under Messrs. Kynoch's care. The promising results of analyses

of Agaul obviously point to it as an important cane to preserve for future cultivation. I cannot agree however that the retention of these canes in odd plots scattered through the country, even though they are disease-free, would be justifiable. The necessities of the situation are that the only susceptible canes which are retained shall be collected together in one or a very few sites, where they can readily be inspected at frequent intervals. The Proclamation will make provision for this arrangement, by allowing the growing of susceptible varieties under special permit.

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## DISCUSSION ON THE PAPER.

Mr. W. E. R. Edwards stated that he thought the whole of the industry was indebted to Mr. Storey for his paper, and more indebted to him for his work during the last twelve months or so. He thought if the records of the sugar association were looked up it would be found that twelve years ago the question of the Natal industry being dependent on one class of cane was raised and the danger was then realised. Steps were taken by the old Natal Sugar Association to have an Experiment Station on the Eastern Vlei. That went on for some time and then it was done away with. In those days they had no assistance from the Government, and that was why they now appreciated the work the Government had done and particularly the work which Mr. Storey was doing.

There were one or two things in Mr. Storey's paper, however, on which he was going to be brave enough to differ from Mr. Storey. He disagreed with him for one particular reason, that Uba cane was the only cane they were dependent on. During the last ten years they had been trying to get other cane in the country. The old Natal Sugar Association took care that the introduction of the new canes should be under the control of the Government at the Point, so that they should be isolated, and no one could import cane except the Sugar Association. This Agaul cane had gone to different parts of the North and South Coast. The Agaul cane on the South Coast had proved to be diseased in the majority of cases. The Agaul cane on the North Coast, particularly at Umhlali, had proved to be a very excellent cane; to be a prolific grower, heavy yielder, and a cane which the industry had been looking for, low in fibre and high in sucrose. That cane did not show any signs of mosaic disease. That cane had been inspected two or three times and was owned by two or three planters.

A year ago, and even today, a certain amount of doubt exists—not in Mr. Storey's mind, but in their minds,—as to whether that cane was really Agaul or Uba. He had mentioned the difference in fibre content and sucrose content of this Agaul. He could say that analyses were made which showed a fibre content of 12 per cent, which with the Uba they were

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getting today was very remarkable. The fact remained that the Agaul cane at Umhlali today was free from mosaic disease. Although he sympathised with Mr. Storey, and he thought Mr. Storey was perfectly correct in his idea that the Industry should leave no stone unturned to get rid of mosaic disease, he did not think that any cane, especially if it had not been proved to be susceptible, and even if susceptible that any cane which was free from disease, should be destroyed particularly a cane as good and reliable as this Agaul. During the last year a certain amount of that cane had been replanted. Potatoes and other similar crops were annual crops. Cane was put in for seven or eight years, and it was therefore far easier to deal with an annual crop than with a cane crop.

Coming to the question of compensation for diseased cane, on the South Coast one planter had anything between 17 and 20 per cent of his total holding and it was diseased. 70 acres of cane was a very valuable asset, and it was quite impossible for that man to reap his cane by 1925. It was too much to ask that man to get rid of that cane by January next year without his getting compensation. The point he differed from Mr. Storey particularly on was that if they had a good cane which was free from disease there was no reason, to his mind, from the layman's point of view, why that cane should not be controlled in that area and periodically inspected. If at any time it showed disease then it could be destroyed. Now that they had a class of cane which was sound and free from disease it did not appear reasonable to immediately read the Riot Act over it and cut its throat.

Mr. Storey in reply stated that Mr. Edwards' criticism fell under two heads. In the first place he considered that Agaul cane should be retained as a second string, and in the second place he considered that it was not risking the efficacy of the mosaic control measures if one retained cane which was at present mosaic free but susceptible.

He would deal with the second point first. He pointed out that Mr. Edwards had admitted he regarded it from a layman's point of view, and he believed that the layman had small conception of the difficulties of the eradication of disease and the need for the most elaborate precautions for eradication. Florida, as Dr. Brandes had mentioned in his letter, had been freed of mosaic disease. How had that been done? Not by eradicating just the diseased stools of cane; they went all out and **eradicating the whole of the cane within half a mile of any diseased cane.** That meant eradicating approximately a square mile of cane. The layman would probably regard that as most extravagant precaution, but it was considered necessary by those who knew the difficulties of eradicating a disease, and it had been justified because it had been successful.

As he had previously stated, he was in favour of retaining various of these established canes, but

only in one or possibly two places where they could be frequently inspected. If they were prepared to appoint a Plant Pathologist to more or less spend his whole time in inspection of plots he thought it would be a reasonable thing to retain a larger number, but it would not pay them to do so. That he was quite sure of. He was working more or less alone and had a great many things to do, and could not possibly undertake the inspection of more than one or two plots because they had to be inspected at frequent intervals. Speaking roughly, his opinion was that any plot in which the disease broke out would have to be eradicated entirely. That was to say, with regard to the area of Agaul to which Mr. Edwards referred, if one case of mosaic disease developed in it the only sound thing would be to wipe out the whole area. He considered that if that area was spared now it would only be deferring the day of destruction. In any case he would say that in his opinion to leave areas of susceptible cane now, other than one or two which could be frequently inspected, was scientifically unsound and was going to do more harm than good to the industry. It was scientifically unsound and in practice it was going to do much more harm than good.

He did not suggest wiping those canes out entirely. He referred to Agaul and Argentine cane particularly, both of which had shown promise in this country, and which he expected could be grown in the future. It might furthermore be argued that that area of cane in the Umhlali district might be retained as a stock of Agaul cane for future plantings. Under certain circumstances he might be prepared to agree to that, but unfortunately he knew the plot that Mr. Edwards referred to. He happened to know that it was streak diseased to the extent of at least 50 per cent. To retain that for propagation throughout the country would be suicidal. If they were going to distribute Agaul throughout the country at least they wanted to distribute healthy Agaul. In his opinion therefore what they wanted was the Experiment Station to take up this matter at once. Select healthy Agaul, that is Agaul which was free from streak disease and mosaic, and propagate that rapidly at the Experiment Station under careful and frequent inspection.

That was a perfectly feasible thing, but this particular plot to which Mr. Edwards referred would be of no value to the industry as a stock of cane except as a diseased stock of cane, and he took it that no one had any desire to propagate that. Therefore the only excuse for retaining that particular plot of cane was the excuse that it was of value for sugar making and would be of value for the next six years. That was to say the individual owner of that was to benefit by its retention and nobody else. Were they prepared to agree that that individual should benefit to their detriment as a whole? Wherever the question of compensation came in he thought the whole of the industry should have a word to say on

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the matter, and that should be unquestionably "destroy it, whatever it costs."

Mr. Edwards replied that he was still unconvinced by Mr. Storey's arguments. The suggestion that he, as representing a large company, should suggest that they have a stock of diseased cane propagated was ridiculous. The fact remained that they had a stock of Agaul cane at Umhlali which was entirely free from mosaic disease, and while on that question he thought he could say that he was one of the first to take this matter up. Nobody was keen in Natal at that time on eradicating streak disease or any other disease. It was through his efforts that the first cane expert inspected cane in Natal.

Anyhow he was not convinced. They had Agaul cane at Umhlali which was entirely free from mosaic disease. The source of that cane was supplied by an experimental farm. Great care had been taken with it and if any streak disease was in the cane it could be eliminated; it was not so serious as mosaic. He had never suggested that they should keep a stock of diseased Agaul cane to spread throughout the whole country. He pointed out that it had not yet been settled whether that cane was Agaul or Uba. To rush in and destroy all Agaul cane whether free from mosaic or not was a great mistake. He did not want to put his ideas against the ideas of Drs. Brandes or Earle or anyone else, but he did think that in this matter they had to go very slowly. The practical difficulties in the way would have to be got over. In this particular instance the quantity of cane at Umhlali was fairly small but in the other instance down the South Coast it was a question of 70 acres. There he did think the question of compensation came in. The Government paid compensation in other directions and he did not see any reason why exception should be made in the cane industry. In many ways the sugar contributed a large amount to the Government funds. Reverting back to the Agaul cane at Umhlali Mr. Edwards stated he did not see why that cane should not be controlled at Umhlali in the same way as at an Experiment Station. If it meant having a plant pathologist then a plant pathologist could be found.

Mr. O. J. Johnson stated that this question of diseased cane had been a vexed question for the last twelve months. He wished to congratulate Mr. Storey that his diagnosis of the disease had been substantiated by such prominent men as Dr. Earle and Dr. Brandes. Mr. Edwards' attitude on this matter had been rather a surprise to him because the difficulty chiefly lay before, in discussing this question of all diseased cane, with certain millers who had quite large quantities of it. Personally he thought it would be rather a dangerous position for this meeting to go into the question of eradication. Nevertheless they had to face the thing, and seeing that it was bound up with the success or otherwise of the Experiment Station and seeing that the direc-

tor of that station would be arriving very shortly, he thought it would be as well if the matter was left over until after Mr. Dodds' arrival. In establishing an Experiment Station he felt that they had to start with a clean sheet. He took up no attitude in regard to the plots at Umhlali. It did seem to be a pity to eradicate them if they were free from disease. They wanted the advice of the man who was going to propagate the new varieties of cane so that they would get better results in the future. From the standpoint of the planters it would be the best way to deal with the matter.

Then on the question of compensation, he felt sure from the standpoint of the industry, they would be sorry to see any individual planter, who was penalised in any way and whose cane had to be eradicated, become a sufferer for the benefit of the whole industry. It was up to the Government to take this matter in hand in its entirety. They did in other matters and he did not see why they should leave the sugar industry to fight their own difficulties. But he did maintain that it was up to them as an industry, if one man suffered for the benefit of all, to help that man if the Government will not do it. As far as the planters were concerned he did not think they had taken this matter as fully into consideration as they ought to. They had been told that this disease was among them and they had practically turned the blind eye to it. Today they realised that they were faced with this disease and they were very anxious that the Experiment Station should soon be launched so as to give all a crop of clean cane for planting.

Mr. Warner stated he hoped Mr. Storey would not mind if he was absolutely frank and open in his remarks. First of all he was very surprised that Mr. Storey should have given ground and raised the question of streak disease when they were discussing mosaic. It was very important to stick to mosaic. He thought Mr. Storey would admit that so far as the Planters section of the industry was concerned, he had had the whole hearted support of that section in every recommendation he had made during the last twelve months. Personally he (the speaker) happened to be one of the people involved in this question of Agaul cane and he thought he was right in saying that it was only on this question of Agaul that there was any difference of opinion at all. Twelve months ago Mr. Storey had made a statement to the effect that he hoped they would not be surprised if he were to tell them that the Agaul cane or so-called Agaul cane in the Umhlali district was really Uba. He did not wish to pin anyone down to a statement made in all good faith. They all made mistakes at times. He did not want to keep harping on the point, but what he did want to emphasise by that statement was this; that the close similarity of the so-called Agaul cane in that particular district showed it to be so closely allied to Uba that even Mr. Storey with his knowledge

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could not differentiate and say definitely whether it was or was not Agaul.

He would like to put it to Mr. Storey in this way, as the person who had the most of this so-called Agaul cane. That cane had been inspected by Mr. Storey on at least two occasions. It had been growing alongside of cane that was mosaic diseased and it had been growing there for a period of practically two years. Today there was no sign of mosaic in it. It was so closely allied in appearance to ordinary Uba that even Mr. Storey could not show any definite difference in the growth or formation either in bud, leaf, or anything else, between that so-called Agaul and Uba. Therefore it was quite easy—and he did not wish in any way to cast any reflection on Mr. Storey—to make the statement which he had made twelve months ago, and which could easily be made by anybody to-day. The attitude they took up was this: there were other features which may possibly have come into the question, which had not received the consideration which he thought they were entitled to.

Without casting any reflection on the past management of the Winkle Spruit Experimental Farm it was quite possible that varieties may have been sent away which were not quite the variety that they were labelled. Therefore it was quite possible that the Agaul cane (there were only two of them who got it) in the Umhlali district may not have been what was written on the case.

Then there was another point. In cane there was such a thing as sport cane. It was quite possible that this cane was a sport cane. He raised this as a possibility. Anyhow the position to-day was that in spite of all their many endeavours, and in spite of feeling a bit despondent at the moment, they all felt that the prehistoric method of paying for cane on weight alone and not considering the sucrose content, must give way. When they had a cane that not only in laboratory tests, but also on field tests, gave 4 per cent higher sucrose than adjoining cane, lower fibre, and a very much higher purity, and if that cane had been growing for two years and had not contracted disease, then he did hold that the question was open to further investigation.

Speaking for himself, he thought the suggestion made by Mr. Storey was the only feasible one. Mr. Storey claimed to be able to transmit mosaic disease. He had been to their fields and taken samples of their cane. If within a reasonable time Mr. Storey could tell him that he had been able to inoculate the sample with mosaic and they were showing mosaic, he was prepared on his part, and he thought he could speak for the other person interested also, that they would destroy every stick of Agaul cane there was on their properties. Until that had been done he thought there was a reasonable argument that that cane should be left.

Mr. Ladlau stated that he had been dealing with

Uba for twelve years. Two years ago he saw some of this Agaul cane being transported to the railway station. He asked the owner if he might take a few sticks to plant and was told to take them. He went down specially to get some of that cane and he could see nothing but Uba. He asked the driver of the wagon where this new cane was and he pointed it out. Mr. Ladlau stated he could see no difference between that and Uba so he had left it and that was the reason why he had no Agaul cane.

Mr. Edwards stated that this cane was originally sent from Winkle Spruit and it was consigned as "Agaul or Egyptian Uba."

Mr. Storey stated that they were up against an extraordinarily difficult proposition. As had been pointed out by Mr. Warner this was a cane which he (Mr. Storey) defied anybody to distinguish from Uba by mere examination. Whether mill tests might conceivably distinguish between the two he did not know. He had examined these canes with extreme thoroughness, and on no botanical characteristics could one distinguish them except by the single thing that Agaul may contract mosaic and Uba never does. The question of what this cane at Umhlali was, was still a mystery. He was afraid he had tried to help things on by making one or two rather rash statements at times. Mr. Warner had been very kind to him in not rubbing it in more severely; but he had expressed the view that it was possibly Uba that they had at Umhlali. He did not know what to think. Mill tests had been produced which seemed to discount that it was Uba and yet it might be an improved sport of Uba. The only thing to do was to determine whether it would contract mosaic disease or not. He had already started to try and prove that. Meanwhile he did not for a moment suggest the destruction of that cane until he could produce clear evidence to place before the owners of that cane, that it was really Agaul and was really susceptible to mosaic. Then perhaps the question of its destruction would come up for practical discussion. He was afraid that perhaps he was rather at cross purposes with Mr. Edwards. It was quite possible that they were both wrong, and that it was not Agaul but an improved variety of Uba, or at any rate a cane that is not susceptible to mosaic. Personally his own views were not cut and dried on that subject. He however did say that all Agaul suffering from mosaic and all Agaul capable of contracting it should be destroyed.

Mr. Warner asked how long a time should elapse before Mr. Storey would be able to say whether the samples taken were subject to mosaic.

Mr. Storey replied that he could give a definite answer within six months. With regard to Mr. Edwards' remark that that cane had come as Egyptian Uba, the history of that was that it was imported from India under the name Agaul. Owing to its similarity to Uba the then Manager of the Winkle Spruit Farm took it upon himself to call it "Indian

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Uba" and the confusion between India and Egypt was presumably obvious. The Manager of that Station had explained to him that the reason why he called it Indian Uba was because it was similar to our Uba.

Mr. Staniland asked to what extent the present explanation would affect the Proclamation, if all canes had to be eradicated by January 1925.

The Chairman replied that the Proclamation was only being brought before the Association for its approval and had not yet been promulgated.

Mr. Edwards stated that with regard to the analysis of Agaul and Uba cane, he did not know whether Mr. Storey was quite conversant with the many analyses that had been made in the country. Widely differing analyses of Uba had been obtained.

In one case they had had a Uba with 16 per cent sucrose. The general feeling among one section was that the Uba was deteriorating. New plants had not been brought in from Natal to Zululand and the Planters had only their old plants to rely on, and in that way they were really in-breeding their own cane, so that it was not the same as it was say 14 years ago. That was borne out by the yields that the Uba would give under very good conditions to-day compared to what it gave twelve years ago. Taking that all into account he wanted to emphasise that the analysis of Agaul cane at Umhlali did not necessarily mean that it was Agaul and not a Uba. He felt perfectly certain that the whole industry was behind Mr. Storey in his endeavour to take the most practical means of getting rid of mosaic disease.

## THE MYSTERY ARMY WORM

(Paper by C. P. Van Der MERWE, Government Entomologist.)

Last year in a paper read before the Sugar Congress, I made mention of the Mystery Army Worm as one of the insect pests which is of lesser importance to the sugar grower. This year the pest made its appearance again, causing considerable damage to cane in some fields on the North Coast, and owing to the interest the invasion has aroused, I have selected it as the subject of my paper.

Instances of the sudden appearance of insects in large numbers are not rare and everybody can recall cases to mind. To the layman these invasions are often a mystery and it is possible to find persons not so well informed who will insist that spontaneous generation is the only possible explanation! The entomologist, though he knows something about insects and their ways and especially about their fecundity (quick growth) and the rapidity with which some of them can multiply, often has to admit that there are certain features about these outbreaks which he too cannot explain without careful investigation. That, too, was the case with the invasion of the caterpillar under discussion, and it was named by an entomologist "The Mystery Army Worm." The term "Army Worm" is applied to caterpillars which appear in such large numbers that they destroy the food supply on the ground where they were bred and have to march off to find new supplies.

Army worms are not infrequently mentioned in entomological literature. In Australian, Canadian and United States publications, e.g. they are fre-

quently discussed. All the information available about foreign army worms, however, did not explain every puzzle in connection with our army worm. The insect was first brought prominently to the notice of South African entomologists by the outbreaks of five years ago. What then led to its being given the name mentioned above was the circumstance that outbreaks might occur long distances—perhaps a hundred miles or more—from a previous outbreak. The explanation seemed to be that the moths fly that distance, probably at night, from the place where they were bred before depositing their eggs. I have myself observed in Durban the presence of swarms of moths where before no caterpillars were seen and shortly after there was an outbreak of the pest. The sudden appearance of numerous moths was also reported from Reunion. Both at Durban and Reunion the moths were seen in the day-time. They were not flying, but resting or in hiding. There were no means of knowing whether they came from a shorter or longer distance, but that the moths may appear suddenly in places where the caterpillars were not observed strengthens the theory that they do migrate. It is evident that it is a great advantage to the insect to be able to migrate a long distance from the place of origin and so escape the natural enemies which may have gathered to prey on it. Eleven different species of parasites have been bred from the caterpillars in Durban, and many birds, monkeys, etc., prey upon the caterpillars,