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CARIBBEAN FOOD CROPS SOCIETY

PROCEEDINGS



**ELEVENTH ANNUAL
MEETING**

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CARIBBEAN FOOD CROPS SOCIETY ELEVENTH ANNUAL MEETING

The Eleventh Annual Caribbean Food Crops Society Meeting was held in Barbados as a result of an invitation from the Government of Barbados.

This meeting was organised in Barbados with Mr. W. deCoursey Jeffers as President and Mr. Ronald A. Baynes as Vice-President. The Caribbean Food Crops Society acknowledges the assistance of the Government of Barbados, the University of the West Indies, U.S.I. West Indies Limited and the several other organisations and individuals too numerous to mention, who in any way contributed to the successful organisation of the Eleventh Annual Meeting.

MINUTES OF 11TH ANNUAL BUSINESS MEETING CFCS,
CAVE HILL BARBADOS

The business meeting was called to order by the President, Mr. deCourcey Jeffers at 11:50 a.m. at the University of the West Indies, Cave Hill, Barbados on July 6, 1973.

The minutes of the previous meeting in Puerto Rico in 1972 was read and approved. The treasurer's report was read and approved.

Old Business: None reported

New Business:

1. Mr. H. A. D. Chesney, Guyana, suggested that the CFCS Newsletter be used to make known who are members of the CFCS.

2. Dr. C. Walters, Antigua, moved that copies of minutes of the business meeting be made available to members at time of registration. Seconded Mr. T. Fergusson. Passed.

3. Dr. C. Walters, Antigua, moved that the agenda of the business meeting be circulated one day previous to the meeting. Seconded Mr. C. Frazer. Passed.

4. Mr. H. A. D. Chesney, Guyana, moved that there should be an audit report of the accounts of the Society. Seconded Mrs. C. Frazer. Passed. Dr. C. Walters, Antigua, proposed that the CFCS constitution be amended to include a mandatory auditors report of the accounts of the Society. The Board of Directors to appoint the auditors. The matter shall be placed for the next meeting in order to comply with the by-laws of the constitution.

5. Mr. T. Fergusson, UWI, moved that the Board of Directors appoint a 3-man committee to determine the feasibility of setting up a permanent secretariat for the CFCS. Said committee shall submit to the Board of Directors a report within 4 months. The Board of Directors

shall meet in January 1974 to consider the report. The final recommendations shall be submitted to the members at the 12th Annual meeting. Seconded Mr. H. A. D. Chesney. Passed. Selected for this committee were V. Sargeant, T. Fergusson, and H. Miller.

6. Mr. A. G. Naylor presented Jamaica as the proposed site for the 12th Annual Meeting CFCS in 1974. The gracious offer was unanimously approved by the members.

7. Proposed sites for the 13th Annual Meeting CFCS in 1975 were St. Vincent, St. Lucia, and Grenada. Mr. R. Baynes shall determine which of these sites might be available.

8. The Nominating Committee presented their recommendations for the officers of CFCS for 1973-74. There were as follows:

<i>President of the Board</i>	Mr. deCoursey Jeffers	Barbados
<i>Board of Directors</i>	Mr. G. Anais	Guadeloupe
	Mr. R. Baynes	Barbados, UWI
	Mr. H. Beckford	Jamaica
	Mr. H. A. D. Chesney	Guyana
	Mr. L. Cross	Trinidad
	Dr. C. Walters	Antigua
<i>President</i>	Mr. Hugh Miller	Jamaica
<i>Vice-president</i>	Mr. A. G. Naylor	Jamaica

The report was received and all proposed officers were elected unanimously.

9. Dr. C. Walters, Antigua, moved that the outstanding Proceedings of the CFCS for 1970, 1971, 1972 be edited, published, and distributed by December, 1973. Seconded G. Anais. Passed.

10. Mr. H. A. D. Chesney, Guyana, moved that a vote of thanks on behalf of all CFCS members visiting Barbados for the meeting be

extended to the President, vice-president, and all peoples on the local committee who worked so hard to make the 11th Annual Meeting an outstanding one. And also for their hospitality apart from official acts. Seconded Mr. A. G. Naylor. Passed.

There being no further business, the meeting was adjourned.

ADDRESS OF WELCOME BY THE HON. A. DaC. EDWARDS, MINISTER
OF AGRICULTURE, SCIENCE AND TECHNOLOGY, AT THE
OPENING CEREMONY OF THE ELEVENTH ANNUAL
MEETING OF THE CARIBBEAN FOOD CROPS
SOCIETY HELD AT MARINE HOUSE,
HASTINGS, CHRIST CHURCH
BARBADOS, ON 2ND
JULY, 1973

Mr. President, Honourable Ministers, Distinguished guests,
delegates, ladies and gentlemen:

Nine years ago, Barbados had the honour of hosting the Second Annual General Meeting of the Caribbean Food Crops Society. A similar honour has fallen to this country at the Eleventh Meeting.

It is fortunate that the Society was formed some years ago, and not at the 'eleventh hour', in order to meet the crisis with which we are faced. The main objective of the Society was, and still is, to advance Caribbean food production and distribution in all their aspects, with the end in view of improving the levels of nutrition and standard of living in the Caribbean.

I note from the Agenda for the technical sessions, that a variety of items will be discussed. Papers will deal with crops such as tomatoes, cabbage, cucumber, red peas, peanuts and so on. Perhaps, you will excuse me if I single out the full title of one paper: it is "Increases in sweet potato yields by soil fumigation." I have done this, because, here in Barbados, it had recently been found necessary to import sweet potatoes from a neighbouring island, and the price has been a very high one per pound. Agricultural Ministers throughout the world are under heavy fire; but, the truth of the matter is, that there is a shortage of food crops throughout the world, to meet the demand of an ever-increasing population.

It is very distressing to read that there are millions of people who, in what we like to call a progressive world, are suffering from

malnutrition or actually dying from hunger. Some of those numbers live around us in this Caribbean Region.

If we forget politics and view the problem from humanitarian grounds, we will realise that the task is ours – you, the members of the research team of this Society, and persons administering Governments – to endeavour to find solutions to the problems facing this area, and also wider afield.

A man can work hard, save and borrow money to build a house and buy other material goods. He can take his time to acquire these things – many years in some cases – but not so with food. It must be taken daily. It is therefore very appropriate that serious study be made of the food situation, both from the technical and policy-making angles.

It is not in my place this morning, at this particular meeting, to make grandiose policy statements; but, I must mention that, throughout the Caribbean, there is a moving away from working the land, and that is why so many items of food are so scarce and costly. You, researchers, must exchange material and information on the various aspects of food production, processing and marketing in this area, in order to save duplication of effort and waste of time.

We are well aware of the present difficulties in obtaining enough supplies of grain, animal feed, rice and so on, throughout the region, and so I am pleased to see that you intend to discuss subjects dealing with soils, climate and water situation, which are so vital to the good production of any crop.

We all speak of import substitution, but we have to face facts. However we try, the older developed countries find a way to keep ahead of us. We must find a way to prevent too great a lead on our first innings. This coming together of people from all over the Caribbean, with the purpose of working towards the co-ordination of research and development programmes in the field of food crops, is a good start.

Food is a common link between many organisations, whether in private enterprise or in Government. For instance, Agriculture, Trade, Industry, Tourism, Education, Health, are Ministries which must interest themselves in this subject: therefore, although there may be a tendency towards political independence, we are forcibly reminded, in times like these, of our common heritage.

The countries in Europe are working together; we in the Caribbean, must follow likewise. Shortly, we will have our own version of a common market; therefore, it is essential that we have something worthwhile to place in that market. For too long now, we have been dependent on others to tell us what to do for ourselves. It is to be hoped that an Organisation such as the Food Crops Society, will help the area to be more self-sufficient. We must pay particular attention to nutrition, for us to produce citizens with healthy bodies and healthy minds. With the sugar industry in the present precarious position, we in the Caribbean, must take stock of our natural facilities, and with the help of science, exploit them to the fullest benefit of all.

The time has come when Agriculture must NOT be any longer considered an Industry of Subsistence. In other words, the time has come when the Agricultural Worker should no longer be expected to work for subsistence wages. The gap between the wages paid to Agricultural Workers and those paid to general workers in other fields of endeavour, MUST BE closed, and this would stem the tide of the general drift away from working the land.

I do not consider that it is my duty, on this occasion, to try to score points by saying, for instance, that Barbados has benefited from these research meetings, and has been in recent years producing good onion crops, and that we have also introduced processed yam. It is too serious a period in the history of the area, to rest on our laurels, or for that matter, to sit back and hope that a 'mother country' is going to come running to help us out of a jam. We must each do our bit and pool our knowledge and expertise.

It would not be amiss for me to mention here, that shortly, an Inter-American Development Bank team from Israel, will be visiting Barbados to advise on rural development. The matter of Agrarian Reform will also be touched upon, and if the Barbados Government agrees that there should be such a reform, I, personally, visualise agriculture in Barbados having a new orientation.

Farming must be made to pay. The old-time association of hard work and low pay, must be eliminated, not only in Barbados, but in the whole Caribbean Area, if we want to advance economically. During your deliberations, you must therefore pay special interest to this thought, and see the Agricultural Worker in a new perspective.

Ladies and Gentlemen, when I earlier mentioned the word 'crisis', I did not do so lightly. We can no longer act like the ostrich, but we must face the problems of the agricultural industry in the Caribbean Area. In this matter, no one can stay aloof, big and small territories, rich and poor; technicians; administrators and politicians, private enterprise; must all join together to promote better conditions in the agricultural sector.

Mr. Chairman, I understand that the Dean of Agriculture of the University of the West Indies, is to give the feature address; therefore, I must refrain from making too lengthy my words of welcome.

However, I would like to highlight a few points here, at the opening of this Society's Meeting, which I shall dub as the beginning of "operation – Import food substitution for the Caribbean Area".

(1) We should pool our resources and rationalize agriculture, so that if any one country/island has a comparative advantage in the production of any food item, then let that territory produce that item in sufficient quantities that the area as a whole will be self-sufficient in that commodity.

(2) At Agricultural Marketing Protocol Meetings, there should not be undue haggling over prices. In recent budgetary proposals,

the Governments throughout the area have put high tariffs on goods coming from outside the Region, in order to stimulate production within the region: therefore, if it is found sometimes that an item locally produced costs two or three cents more than the imported one, we should buy the item in order to keep the money circulating within the region, and to give encouragement to our local farming industries. In due course, a reduction in the price of such items will inevitably come about. And I say this, because I am convinced, that NOW is the time for farmers in the region to be encouraged to produce more food. I am also convinced that our low level of production is a result of the lack of encouragement given to the farmer, because of the low price structure. With a better price structure, yields will be increased, and at such a level, the desirable interplay of Supply and Demand will play a prominent role, and prices will therefore find their true level.

(3) Researchers should make use of the political climate, and try to develop high yielding crop varieties of good nutritional value, to ensure that total demands are adequately met. Towards this end, throughout the area, there will have to be an up-dating of planting, harvesting, processing and marketing equipment and techniques.

(4) We in the Caribbean, have the tendency to prefer items produced overseas, even at a higher cost than locally produced substitutes. Sometimes, the canned products have been processed from items grown in our region, and sold to us at high prices, when, in fact, similar products can be made locally. A Caribbean Food Nutritional Institute Survey carried out about five years ago, pointed to the fact that the bulk of our protein needs is imported, when, in fact, we have the potential to produce the same requirements in this area. A more recent survey carried out here in Barbados by the same Institute indicates that the amount and quality of food intake need improvement in at least one-third of the homes, while in another one-third, the very

quality of the diet needs improvement. I believe that a similar survey in any territory in the region will show similar results. The fact of the matter is that the protein imported from overseas, is usually high-priced animal protein obtained from meat, and because of its cost, it is not obtained by some income groups. But it should be noted that these costly protein foods can be substituted by vegetable protein at a much cheaper price locally. In other words, we want more beans, peas, pulses and legumes grown, and more animals reared in the region.

(5) In order to encourage local production, there will have to be more economic incentives, especially good farm gate prices to reflect not only the cost of production, but the risks and uncertainties involved in agricultural pursuits. In this respect, many acres of land now unutilised and under-utilised throughout the Caribbean, should be brought back into full production, in order to produce more food crops for human consumption and more feed crops for animals.

(6) I can divulge to you now, that we in Barbados are engaged in looking into certain aspects of modernising agricultural credit and marketing facilities, increasing the technical staff and farming incentives. I urge you to encourage your several Governments to do likewise, and help them by submitting schemes which you consider will be beneficial to the area as a whole, and wage the campaign of the operation against importing goods from outside the region, when we can produce locally, items just as good.

(7) I now come to the most crucial constraints to Agricultural Production within the area. In this respect, I refer to processing and marketing of our agricultural produce. One can attempt to take a leaf out of the Book of Venezuela, which has gone a long way in making itself almost self-sufficient in foodstuffs. This is mainly due to the establishment of processing plants for all types of agricultural produce, and a most

up-to-date marketing policy. The farmer in that country is considered a most important person, and all sorts of incentives are given to encourage increased production. A guaranteed market is provided, and there is little wastage of agricultural produce, because of the existence in that country of all sorts of agro-industries. I exhort all of you to come out of this Conference with firm recommendations and commitments for the establishment of similar aforementioned facilities.

It is good to see that representatives from many islands have found it possible to attend this meeting. The local delegates and agriculturists know how strongly I feel on this matter of 'agriculture', but I hope I have allowed some of my zeal to be seen by the visitors, and that on their return to their homeland, they will bear in mind the challenge which the Caribbean faces, and try to do something useful about it.

I welcome all the delegates, but a special welcome goes out to those visiting Barbados for the first time, and those renewing acquaintances. I am sure that you will enjoy yourselves, in spite of the heavy programme which lies before you during the next few days.

Mr. Chairman, ladies and gentlemen, I have much pleasure in declaring open the Eleventh Annual Meeting of the Caribbean Food Crops Society.

**PROGRAMME OF SESSIONS
AND
INDEX OF PRESENTATIONS**

Monday 2nd July, 1973, 2.00 p.m. – 5.00 p.m.

BARBADOS BACKGROUND PAPERS

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|----|---------------------------------------------------|---------------|
| 1. | The Role and Structure of Agriculture. | E. C. Pilgrim |
| 2. | Contribution of Agriculture to Barbados' Economy. | J. Mayers |
| 3. | The Soils of Barbados. | N. Ahmad |
| 4. | The Climate of Barbados. | B. Rocheford |
| 5. | The Water Situation in Barbados. | W. A. Johnson |

TECHNICAL PAPERS

Tuesday 3rd July, 1973.

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|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| 1. | An Investigation on the Yield Response of two Tomato Varieties to Different Levels of Nitrogen and Potash Fertilizer and to a Dry Grass Mulch Cover. | L. Smith |
| 2. | Tomato Varieties, Training and Cultural Practices for the Caribbean. | G. Anais & P. Daly |
| 3. | Investigation on the Effect of Different Frequencies of Harvest on the Yield of String Beans. | L. Smith |
| 4. | Effects of Fertilizer on Growth Yield and Leaf Mineral Contents of Pigeon Peas. (<i>Cajanus Cajan</i> (L.) MILLS P). | J. L. Hammerton |
| 5. | Effect of Planting Date on Soyabean Oil and Protein in Trinidad. | R. A. I. Brathwaite |

TECHNICAL PAPERS – (Cont'd.)

Tuesday 3rd July, 1973

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| 6. | A Yellowing and Die-back Syndrome of Pigeon Pea (<i>Cajanus Cajan</i> (L.) MILLS P). | J. L. Hammerton |
| 7. | Red Pea Variety Testing in Guadeloupe. ... | F. Kaan & C. Suard |
| 8. | The Response of Plantains to Magnesium Fertilizers in Puerto Rico | G. Samuels, E. Hernandez & S. Torres |
| 9. | Yam Planting Density Trials in Guadeloupe. .. | R. Arnolin, R. Poitout & L. Degras. |
| 10. | Studies of Pangola Grass (<i>Digitaria Decumbens</i> Stent) in Barbados.
1. Effect of Level of Nitrogen Fertilization and Frequency of Cutting on the Yield, Chemical Composition and <i>in vitro</i> Cellulose Digestibility. | R. C. Quintyns & E. Donefer. |
| 11. | Attempts at Mechanical Harvesting of Root Crops in Barbados. | W. O'N. Harvey & J. P. W. Jeffers. |
| 12. | A Solar Crop and Seed Drier. | O. St.C. Headley & B. G. F. Springer |
| 13. | The Analysis of an Arrangement Designed for Limited Resources. | F. B. Lauchner & B. G. F. Springer |

Wednesday 4th July, 1973. All Day Field Tour

Thursday 5th July, 1973

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| 14. | The Contribution of Plot Characteristics to the Design of an Experiment. | A. C. Brewer & B. G. F. Springer |
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TECHNICAL PAPERS – (Cont'd.)

Thursday 5th July, 1973.

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| 15. | A System of Project Registration Designed to Facilitate Information Retrieval. ... | R. F. Barnes &
B. G. F. Springer |
| 16. | Plant Parasitic Nematodes Associated with Vegetable Crops in Antigua ... | C. W. D. Brathwaite |
| 17. | Effect of Plastic Mulch and Plastic Canopy on Nematode Population and Southern Blight of Tomato. ... | N. D. Singh & M. S. Sandhu |
| 18. | Studies on the Agromyzid Leaf-miners in Barbados. ... | B. Munir |
| 19. | Pigeon-Pea Pod Borers in the Caribbean. | S. Parasram |
| 20. | The Effect of Local Climate and Soil Factors on Irish Potato (<i>Solanum Tuberosum</i>) Yields in St. Lucia. ... | F. S. Leonce |
| 21. | A Simple Technique of Continuous Irrigation for Hydroponic Sand Culture ... | J. Brochier |
| 22. | Evaluation of Chemicals for the Control of Nematode Population in Cabbage. ... | N. D. Singh |
| 23. | A Greenhouse Trial of the Efficiency of Vitamon d and Enmag as Slow Release Fertilizers using Pangola Grass. ... | B. R. Cooper |
| 24. | Measurement and Estimation of Evapotranspiration in French West Indies ... | R. Bonhomme &
C. V. Grancher |

RESEARCH NOTES – (Cont'd.)

Friday 6th July, 1973.

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| 34. | Evaluation of Cucumber (<i>Cucumis sativus</i>) Varieties in the Leeward Islands. | St.C. M. Forde |
| 35. | The Influence of Plant Density on Sweet Pepper (<i>Capsicum annum</i>) Yields in St. Kitts. ... | St.C. M. Forde |
| 36. | A Preliminary Report on the Development of Avacado as a tree Crop and on Factors Affecting Yield in Barbados. | R. D. Lucas |
| 37. | The Pepper Flower Bud Moth in the Caribbean (an evaluation). | S. Parasram |
| 38. | Possibilities of Onion Bulb and Seed Production in the French Caribbean | G. Anais |

With a view to improving the quality of the Proceedings of the Caribbean Food Crops Society, an Editorial Committee consisting of the following members was established for one year.

W. deCoursey Jeffers	—	Chairman
R. A. Baynes	—	Secretary
E. G. B. Gooding		
V. A. L. Sargeant		

The following persons assisted the Editorial Committee in editing the numerous papers :—

J. Mayers	R. Phelps
N. Ahmad	D. Walmsley
H. A. Sealy	J. P. Jeffers
L. H. Smith	B. Williams
Omawale	R. Pierris
L. Campbell	R. Barrow

TECHNICAL PAPERS – (Cont'd.)

Thursday 5th July, 1973.

25. Some Aspects of Avocado Propagation and Diseases Associated with Nursery Seedlings in Barbados. R. D. Lucas.

Friday 6th July, 1973.

26. Onion Blast Studies I. A Preliminary Report on Onion Blast Disease in Barbados. ... L. W. Small
27. Onion Production, imports, exports and Research for Puerto Rico. G. C. Jackson.
28. Onion Production in Barbados 1967 to 1973. B. W. Eavis & W. deC. Jeffers
29. A Preliminary Report on the Comparative Performance of Some Southern Type Varieties and Hybrids of Onions in U.S. Virgin Islands. ... R. Shulterbrandt & D. S. Padda.
30. Onion Growing in Jamaica. J. H. Donaldson
31. Primary Evaluation of new Unregistered Pre-emerge Vegetable Herbicides. ... G. C. Jackson & C. Sierra
32. System for Field Measure of Erosion, run off, and Oblique Drainage in Ferrallitic Soils on Granitic Matrices in French Guyana. ... P. Blancaneaux.

RESEARCH NOTES

The following papers upon recommendation by the editors have been included in the proceedings under Research Notes.

33. The Evaluation of Cabbage (*Brassica oleracea* var *capitata*) Varieties in the Leeward Islands. ... St. C. M. Forde

ADDRESS BY THE PRESIDENT OF THE CARIBBEAN FOOD CROPS
SOCIETY MR. W. DeC. JEFFERS AT THE OFFICIAL OPENING
OF THE ELEVENTH ANNUAL CONFERENCE AT MARINE
HOUSE, HASTINGS, BARBADOS ON MONDAY 2ND
JULY, 1973.

Hon. Minister of Agriculture, Science and Technology, Mr. DaCosta Edwards, Colleagues sharing the platform with me, Delegates to this Eleventh Annual Caribbean Food Crops Society Conference, and Guests, I mentioned when introducing our first speaker that one of my functions as President of this Society was to perform the duties of Chairman to this official opening session. There is also another function which, as President, I have to perform, and those of you who are familiar with the Constitution and By-Laws of this Society will know what I mean. For those who are not familiar with the Constitution and By-Laws I will quote the relevant section. Article S, Officers, Section 3, President, reads "The President shall be the chief executive officer of the Society and shall be *ex officio* a member of the Board of Directors. He shall have the general powers of supervision and management usually vested in his office subject, however, to the right of the Board of Directors to delegate any specific power or powers to any other officer or officers of the Society. *The President shall deliver an address at the Annual Meeting of the members* and shall perform such other duties and have such other powers as may be prescribed by the Board of Directors, any duly constituted committee, or the by-laws.

I trust you will pardon the detail but I have done this specifically to let you know, that in fact, it is not a love of mine to give addresses, but as I have taken pains to point out, it happens to be mandatory that I should address you.

This is not particularly difficult since for the most part I am flanked on either side first by my own Minister of Agriculture, Colleagues and friends on the platform, and I am facing an audience made up primarily of Caribbean Food Crops Society Members from abroad and from Barbados; local Agriculturists and Farmers; and other prominent members of

our Barbadian Society. In other words I feel fairly well at home in the present company.

Secondly, apparently because of a general food shortage and rising prices looking at us full in the face, there appears to be a very sudden awakening to the fact that there is a profession called Agriculture, and at the moment there is a tremendous amount of lip service paid to all aspects, phases and sections of agriculture. Had these problems not descended upon us, Agriculture might well have remained as obscure as it always has, so that in fact, this food shortage might well turn out to be a blessing in disguise for all those engaged in the various agricultural enterprises.

Our daily paper on June 28, 1973 is quoted as saying "Apathy towards agriculture on the part of young people is evident in the Caribbean. Production is inefficient and marketing arrangements often fall flat, because supply cannot match demand as and when it is required." The question I raise here is the mention of 'Apathy towards agriculture on the part of young people'. In my opinion this apathy appears to spread from older people down to the young, and if the reasons for this were carefully examined and analysed, I am inclined to feel that frustration, inadequate storage, insecurity, lack of firm guarantees, difficulty in obtaining credit and other factors have all added up to turn interested persons to more secure rewarding and guaranteed enterprises.

It appears obvious to anyone travelling through the Caribbean that Agriculture is in fact facing difficult times. One cannot help but notice the drastic reduction in cultivatable land in just about all of these islands, and this at a time when food is becoming less and less, and as a result prices are going up and up. I am mindful of a statement recently quoted in the local papers purported to have been made by the Carifta Secretary General, Mr. William Demas while addressing a Rotary Convention in St. Kitts. The statement reads as follows:— "We in the Caribbean today are making a very serious mistake in turning our backs on Agriculture and not giving it sufficient attention, because we cannot have a soundly based economy until Agriculture is developed." Ladies and Gentlemen I can only

say that I fully endorse that statement. However I further add, that it is going to take a lot more action, real assistance, and less talk to properly develop agriculture in our area.

Some of you will probably be asking the question right now, how can this Caribbean Food Crops Society play a role in the future development of agriculture in the Caribbean? I could probably best answer such a question by quoting from the objectives of the organisation which reads as follows:—

“The objectives of the Caribbean Food Crops Society are: to advance Caribbean food production and distribution in all their aspects to the end of improving levels of nutrition and standards of living in the Caribbean through:—

(a) facilitating exchange of material and of information on all aspects of food production, processing and marketing in the Caribbean area.

(b) stimulating and presentation of information available on food crop production, processing and marketing of food crops in the Caribbean area.

(c) assisting in the general dissemination of information on the production, processing and marketing of food crops in the Caribbean area.

(d) provide a regional consultant service in food crops for the Caribbean area.

(e) maintaining close contact with research problems and progress in the fields of food crops production, processing and marketing.

(f) working towards the coordination of research and development programmes and the optimum use of the resources available in the Caribbean area stimulating the development of joint projects of

research or development where such projects can be of value to the region as a whole.

(g) cooperation with organisations dedicated to the fostering of cooperation between countries of the Caribbean area.”

Ladies and gentlemen these are all laudable objectives, no one can deny. It must however be remembered that every member has in many cases more than one job to perform, and can therefore devote only a limited time to the business of this organisation. This is where some of the business organisations in the area can assist. Provision is made for sustaining membership. Sustaining membership shall consist of individuals or organisations contributing to the support of the Society. The annual subscription is One Hundred Dollars U.S. This kind of support will help us to accomplish some of our objectives as set out. I should add here that Barbados is one of the few Caribbean Governments that is a sustaining member and has paid the annual dues regularly, I would like to see other Governments do likewise, it would certainly help the Society.

I am also quite concerned over the fact that this Caribbean Organisation should in fact be far more useful to the smaller Caribbean Territories than it has been. In these Territories General Agriculturists in many cases are expected to perform as jack of all trades. The moment food production intensifies so also do the disease problems. Nematode problems, Virus problems, Insect problems etc. etc. It seems to me that to involve these Generalists with the appropriate specialists could only result in tremendous benefit to the Generalists. I therefore would urge more representation from the smaller territories. This does not mean however that the larger territories should usurp the organisation, in my opinion the personal contact of research workers permits for an exchange of views, a comparison of programmes etc. etc.

I am aware that smaller territory representation is very often governed or dependant upon finance. Again in my opinion it is likely to be far more beneficial for smaller territories representatives to become more familiar with other Caribbean Agriculture, than Scottish, English,

Canadian or United States Agriculture. Where there is a will there is a way, and a source of funds should be found so that these smaller territories can obtain some benefit from these Annual Meetings, by being able to attend.

Mr. Minister, Delegates, Guests, I have performed my function, I have delivered my address. Before taking my seat I must resume as chairman and introduce the next speaker, who will in fact be giving the feature address. Before the introduction however I must join with my Minister in extending to you a cordial welcome and I trust that your stay in Barbados will be fruitful, rewarding and enjoyable.

REFLECTIONS ON AGRICULTURAL EXTENSION IN THE COMMONWEALTH CARIBBEAN

by

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INTRODUCTION

According to the Food and Agriculture Organisation of the United Nations, "Agricultural Extension is essentially an informal educational process and its purpose is to change attitudes and practices of the people with whom work is done. It makes available to rural people scientific and other factual information".

In the United States where perhaps it has been most highly developed,¹ "Cooperative Extension work in agriculture is a partnership undertaking between each State Land-Grant College and University and the United States Department of Agriculture, in cooperation with local governments and local people. Extension is a unique service of three levels of government permitting maximum flexibility and adaptation to local conditions and needs while carrying out a hard core of purposes, objectives and focus.

"The major function of the Cooperative Extension Service, as stated in the Smith-Lever Act, is 'to aid in diffusing among the people of the United States useful and practical information on subjects relating to agriculture and home economics, and to encourage the application of the same'. This broad charter clearly identifies Extension's function as education. This is not education in the abstract, but education for action. It is education directed to helping people solve the various problems which they encounter from day to day in agriculture, home economics, and related subjects."

1. Miller, P. A. et al: *The Cooperative Extension Service Today: a statement of scope and responsibility*. USDA, Washington. 1958.

This educational work has been called agricultural extension in some countries while in others it is known as agricultural advisory work or, in a broader sense, as community development, rural construction or reconstruction, fundamental education, or mass education. Broad programmes of community development, etc. include agricultural extension as well as nutrition, health, sanitation, literacy and cooperative development.

Paul Leagans² of Cornell University has pointed out that “the entire theory and practice of education extension in the United States appears to hinge on ten central or normative concepts which can be rather precisely stated:

- “1. The supreme and central function of the extension service is to promote the development of people economically, socially and culturally by means of education.
 2. The essential purpose of extension teaching is to facilitate among people a grasp of the meaning of knowledge, to help them see its connection to their problems, and to help them to develop skills needed to apply useful knowledge to their problems.
 3. The extension service must be understood, conducted and judged as an educational instrument.
 4. The extension service must be organised to provide educational services for large numbers of people who need them and to respond to their needs without restriction, to the extent of their resources.
 5. The extension service must be operated in close continuous mutual relationship with the people it serves.
2. Leagans, J. Paul: *Developing Professional Leadership in Extension Education*. Cooperative Extension Publication No. 3, Cornell University, New York.

6. The extension service must seek to achieve its purpose by initiating, stimulating and guiding the process of education.
7. The extension programme must be oriented and organised to deal with the current practical problems of people and also with those of a long-term nature.
8. The extension service must be an institution in which those whom it serves derive satisfaction from their participation.
9. The county extension staff must be viewed as occupying the central position in the organisation and conduct of extension work.
10. The programme of training for extension workers must be designed to develop competent technicians who are effective educators.”

It is a truism that “extension work grew out of a situation. It has come to be a system of service and education”. It would be useful to take a quick look at how it developed in various countries relevant to the situation in the Caribbean.

EVOLUTION OF AGRICULTURAL EXTENSION SERVICES

EUROPE

A Working Party³ appointed by the Organisation for European Economic Cooperation (OEEC) in 1950 stated that “in several European countries the origin of Agricultural Advisory work dates back over one hundred years. In its initial phases it was not organised in accordance with present day concepts but was concerned largely with the efforts of outstanding and progressive individuals. From 1840 onwards, travelling teachers of agriculture were found in many countries. Organised Advisory Services were initiated in most cases after the beginning of the present century and came into being largely through the intervention of governments or farmers’ organisations. Their advent was due to a recognition of the economic need to bring scientific advances in agriculture into farm practice. This marked the change from the pre-scientific to the scientific age in the field of agriculture and rural welfare”.

The term “Extension Education” was used to describe a particular educational innovation by Cambridge University as early as 1873. This innovation was to take the educational advantages of the university to ordinary people where they lived and worked. Within a decade or so the movement had spread to other institutions in Britain, the United States of America and elsewhere. The first grants to the extension movement from public funds, in this case from the English County Councils, were for extension lectures in agricultural science.⁴

The Agricultural Advisory Services established in most European countries at the beginning of this century differ in regard to organisation,

3. Working Party of Experts: *Agricultural Advisory Services in European Countries*, O.E.E.C., Paris. 1950.
4. Farquahar, R. N.: *Comparative Agricultural Extension*, Melbourne. C.S.I.R.O., Australia. 1962.

field of activities, staff and efficiency.⁵ The services in the different countries have been very much affected by historical, economic and social conditions prevailing at the time. Two different systems of organisation can be distinguished, namely, a system entirely managed and directed by the government, as in the case of England and Wales, and a system managed by growers organisations and agricultural societies as in the case of Denmark; transitional systems between the two being found in several other countries.

Agricultural extension in England and Wales is the responsibility of the National Agricultural Advisory Service* which was established in 1946 in the Ministry of Agriculture and Fisheries. The NAAS has connection on the one hand with the Research Centres and on the other with the Agricultural Education Service of the Local Authorities. Research in England and Wales is mainly financed and coordinated nationally, but the actual research is entrusted to grant-aided universities and other institutions. The Agricultural Research Institutes are grant-aided institutions organised on a subject-matter basis: horticulture, plant breeding, plant pathology, etc. The NAAS also maintains Experimental Husbandry Farms and Experimental Horticultural Stations to test out under various soil and climatic conditions the results obtained at the Research Institutes and to incorporate them into practical farming.

Agricultural advisory work first received financial support from public funds in 1910 and universities and local education authorities both supplied services, the universities and agricultural colleges supplying provincial specialist services and the local authorities general advisory services. The Luxmoore Committee in 1943 severely criticised both the county and the provincial services and recommended the establishment of one national agricultural service for England and Wales. It proposed that a

5. *Methods of Agricultural Extension*. Training Centre organised by the International Agricultural Centre in collaboration with FAO and the Natural Security Agency. Wageningen, the Netherlands. 1953.

* Since May 1971 renamed the Agricultural Development and Advisory Services, with some services removed and development functions added.

“district” of not more than 1,000 farms or 100,000 acres should be the primary unit, each with a “general practitioner” district advisory officer having a sound knowledge of basic sciences and farm practice including farm management and farm accounting. The county was the next unit with a general county officer to coordinate the work of the district officers with the aid of county specialists. The specialist services continued to be based on the province. A recommendation that all agricultural educational and advisory programmes be placed under a National Council for Agricultural Education was not accepted and agricultural education was treated as part of further education generally, a responsibility of the local authorities.

At present, the NAAS has to cover the whole of England and Wales and to provide a nearby point of contact for every farmer and grower. The majority of the 1,500 members work in counties and regions. An adviser can expect to spend several years at each of a number of different NAAS centres. The Director, Deputy Director, and senior advisers are stationed in London but do a good deal of travelling.

There are seven Regional Offices and three sub-centres, each region having at its head a Regional Director, a deputy and a large staff of subject-matter specialist officers in the various applied science fields, husbandry, horticulture, and farm and horticultural management, as well as a number of officers who give technical help on demonstrations, experiments, and in regional laboratories, but are not engaged in advisory work. The services of the specialists are available as consultants to all advisory staff in the counties of the region and they travel all over the region to investigate problems on the spot in response to requests for advice.

In each county, there is a Senior Agricultural Adviser, usually a general agriculturist, a deputy and a number of specialist advisers, all based in the county office. The county is divided into a number of districts, each under a District Agricultural Adviser who may be based in the County Office or an Area Office. The average size of a district is about 500 holdings of over 15 acres each. The District Adviser is in direct

contact with the farmer and is the main channel for NAAS advice and through him the contributions of the various specialists can be integrated and the farmer given a coherent plan.

The NAAS undertakes a large experimental programme as a basis for its advice, with two main fields of activity: experimental centres and regional and county investigations. There are twenty odd experimental husbandry and horticulture stations in different parts of the country. These conduct long-term and detailed crop and livestock experiments and investigate local problems. With the help of cooperating farmers, the NAAS carries out many experiments and trials on commercial holdings in the county. Regional specialists have their own investigational plots at the regional centres and both specialists and advisers collaborate in planning the experimental work for each region. The results are printed and made available to every member of the NAAS.

The various groups of specialists keep in touch with university research workers as well as with the various Agricultural Research Council Institutes.

Although the NAAS is part of the Ministry of Agriculture, it does not act as an advocate of Government policy and all members are given full freedom to give the technical and economic advice they think best suited to the circumstances of the particular farm or holding. However, the Ministry looks to the Service for technical help in connection with various grant-aided schemes. They are responsible for a number of regulatory and statutory schemes such as bull and boar licensing, the Milk and Dairies Regulations, the Small Farm (Business Management) Scheme, the Farm Business Recording Service and the Farm and Horticultural Improvement Schemes.

UNITED STATES OF AMERICA

The Morrill Act of 1862 ushered in a new era in American agricultural education. This Act provided land grants to each state for the endowment, support and maintenance of at least one college where the leading object should be to teach agriculture and mechanic arts. The

programme was revolutionary in that it added subjects to the curriculum never before considered worthy of university education; it was designed to provide higher education and training for the industrial classes and it involved a new conception of the function of higher education in society.⁶

This was followed in 1887 by the Hatch Act which established the Agricultural Experiment Station system. Then, as research accumulated which was not being put to practical use by farmers, the Cooperative Extension Service came into being with the passage of the Smith-Lever Act in 1914. This Act established the base for what has become the world's greatest agricultural extension programme.

According to M. O. Watkins, Director, Florida Extension Service, it was found through trial and error over the period 1862 to 1914 that there must be the closest coordination and working relationships between Teaching, Research and Extension and to the present time no substitute for this close tie has been found.⁷ The Smith-Lever Act requires the Extension Services to be attached to and form a basic part of the university system. In the University of Florida, the extension subject-matter specialists are members of their subject-matter departments and are partially responsible to a department Chairman who heads Teaching, Research and Extension and one of whose major responsibility is to ensure that the information being taught by the classroom teacher and distributed by the extension specialist is consistent with the research results obtained on the Experiment Station.

The close working relationship between specialists and research workers makes possible an exchange of information between the researcher and the extension worker. The extension specialist communicates with the researcher as problems are encountered in the field for which no research information is available and the researcher

6. Farquahar, R. N.: Op. cit. p. 113.

7. Watkins, M. O.: Paper presented at the Caribbean Agricultural Extension Conference, University of the West Indies, 1966. p. 1.

keeps the extension specialist informed, not only on new research, but also on research in progress and the indicated results. In this way, there is no lag in time between the release of new information and its dissemination by extension specialists to local extension agents and, in turn, to the users of the information, i.e. the producers. In Florida, it is considered extremely important that the extension subject-matter specialist be as highly trained as his counterpart in research or in teaching. The minimum requirement for an extension specialist is the M.Sc. degree and seldom is one employed without a Ph.D. In this way, there is no barrier between research and extension in the communicating of knowledge, no feeling that the extension specialist is not academically prepared to analyse the information and to put it to practical use.

Dr. Watkins also stressed that there is need for advanced training of county extension agents. The county agent is the local extension worker. He is the front line worker in direct contact with the farmer. In Florida, the county agents are specialised and likewise assistant agents: they are specialists in citrus, vegetables, dairy, etc. The new assistant agent must hold the Masters degree or be registered in Graduate School before employment. This advanced training is necessary where farmers are specialised and have a high level of education themselves, though even in Florida there are many farmers who are not specialised or highly educated.

The guiding principle of Extension workers in the United States has been to help people to help themselves. It "operates informally, in line with the most important local needs and opportunities, and with respect to both short-term and long-term matters of concern. It joins with people in helping them to identify their needs, problems and opportunities; study their resources; become familiar with specific methods of overcoming problems; analyse alternative solutions to their problems where alternatives exist; and arrive at the most promising course of action in light of their own desires, resources and abilities. In so doing, extension workers bring to people the pertinent research information available; interpret and demonstrate its application to the immediate situations involved; and, through the most effective methods known,

encourage the application of such research in solving problems. At all times, the widespread participation of the people is stressed in both planning and conducting these informal educational efforts".⁸

THE COMMONWEALTH CARIBBEAN

In common with most developing countries, the evolution of institutions and services in the Caribbean has been largely influenced by the pattern of developments in the metropolitan countries. In Puerto Rico, the Extension Service has followed the pattern of the Cooperative Extension Service of the United States while in the Commonwealth Caribbean the tendency has been to follow that of Britain, i.e. to separate extension from teaching and research and to place extension in the Ministries of Agriculture.

In order to understand this process, it is instructive to trace the evolution of government agricultural services in the Commonwealth Caribbean in response to the needs of the region. This account must of necessity be rather sketchy and of a general nature, but I think it will suffice for our purposes. The account that follows is largely based on Chapter 1, The Historical Background, and other Chapters of *Agriculture in the West Indies*⁹ and various articles appearing in the *West Indian Bulletin* between 1900 and 1921, in particular the President's address given at the Agricultural Conference of 1899,¹⁰ the first agricultural conference held in the West Indies; a review of the work of the Imperial Department of Agriculture up to 1911 by Sir Daniel Morris;¹¹ and an

8. Miller, P. A., *et al*: Op. cit. p. 4.
9. Colonial Office, Colonial Development & Welfare in the West Indies: *Agriculture in the West Indies*, Colonial 182, HMSO, London, 1942, pp. 1-10.
10. Agricultural Conference 1899: "The President's Address", *West Indian Bulletin*, Barbados, Volume 1, No. 1, 1900, pp. 11-25.
11. Morris, Sir Daniel: "The Imperial Department of Agriculture in the West Indies", Op. cit., Volume XI, No. 4, 1911, pp. 232-248.

article on tropical departments of agriculture by Sir Francis Watts which carried the account of the work of the Imperial Department to 1921.¹²

The original Carib and Arawak Indian inhabitants of the Caribbean region practised shifting cultivation of food crops, probably not greatly different from that still followed by latter day Mayas and Caribs of Belize (ex-British Honduras) and the Arawaks of Guyana (ex-British Guyana). These were quickly more or less exterminated by the European settlers and their farming practices have had little or no effect on the development of agriculture in the area.

West Indian colonisation, first by the Spaniards commencing in the early sixteenth century and by the British, French and Dutch about one hundred and fifty years later, was due, in part, to the demand for what were then rare and valuable commodities, particularly sugar, tobacco and spices. Sugar cane cultivation early became the main industry. To provide the labour required many thousands of Africans were imported as slaves. For obvious reasons, they also contributed little to farming practices and agriculture was based on the practices current in Spain, England, France and Holland at the time of colonisation modified to meet the requirements of sugar cane and other crops. West Indian agriculture consequently did not keep pace with developments in Europe and consequently did not benefit from the agricultural revolution in Europe with its development of rotational mixed farming and alternate husbandry which later occurred there.

For about two hundred years the production of sugar and coffee brought great wealth to the Colonists and there was considerable exploitation of the land resources of the Colonies by the settlers and absentee proprietors. Food production was mainly for and by the slaves, most of the food requirements of the settlers being imported. Shifting cultivation was practised by the slaves on the lands allotted to them for food production in the mountains or "bush".

12. Watts, Sir Francis: "Tropical Departments of Agriculture With Special Reference to the West Indies", *Op. cit.*, Volume XVIII, 1921, pp. 101-125.

The abolition of the slave trade in 1807 and the emancipation of the slaves in 1838 transformed the position and led to the abandonment of many of the less productive estates. On the better estates, cultivation was still profitable due to heavy fiscal protection in the United Kingdom and continued with paid labour, mainly immigrant labour including Portuguese, Chinese and East Indians, the latter continuing under a system of Government controlled indenture until as late as 1917. The East Indians brought with them many of the traditions and practices of Indian agriculture, including rice cultivation and Indian cattle. The Portuguese and Chinese immigrants appear to have had little or no impact on agriculture in the region; in fact, they showed considerable aptitude in moving out of agriculture as soon as they could into the more remunerative distributive and other service industries. This would seem to have been a bit of a waste as the Chinese in particular, with their tradition of four thousand years of farming behind them, could have made an important contribution to farming in the West Indies, especially to the agriculture of food production.

With the development of free trade and *laissez-faire* in Great Britain, the Colonies experienced fresh difficulties. The protective sugar duties were progressively reduced and finally abolished in 1856 and the Colonies were forced to compete on the open market with sugar grown with slave labour from Cuba, Puerto Rico and Brazil. The sugar industry consequently declined even further, going out completely in some islands. Elsewhere, more estates went out of cultivation and many small properties were amalgamated. More attention was paid to alternative industries: cocoa in Trinidad and Grenada, bananas in Jamaica and cotton in some islands during the American Civil War. During the ensuing thirty years, the sugar industry declined still further: European beet sugar fostered by bounties and cartels replaced cane sugar on the British market and prices fell to a very low level. For a time the United States had become the principal market for West Indian sugar due to the imposition of countervailing duties against the European countries but this market was lost with the McKinley tariff of 1898. To add to its difficulties, the sugar industry suffered from the breakdown between 1890 and 1895 with root disease of the Bourbon cane which had been

grown for over a century in these islands. The end of the nineteenth century saw the West Indian colonies in acute distress.

During this period, there had been a slow development of government agricultural services. The first step appears to have been taken in 1764 with the establishment of the first Botanic Garden in the British West Indian Colonies in St. Vincent and in fact in the British Overseas Territories, with the object of facilitating the introduction and acclimatisation of useful plants. The Royal Society of Arts and the Royal Gardens at Kew which had been established in 1760 appear to have been largely instrumental and took a keen interest in further development along these lines in the area. In 1772, a Dr. Young who was then in charge of the St. Vincent Gardens was awarded a gold medal by the Royal Society in recognition of the flourishing state of the Garden.

This development in St. Vincent appears to have stimulated action in Jamaica. Dulcie Powel in *The Botanic Garden, Liguanea*¹³, states that "when the English took Jamaica from the Spaniards in 1655, they inherited, along with its native products, such Spanish imports as sugarcane, bananas and plantains, European vegetables, oranges, limes and ginger. Coffee they introduced some seventy years later. In 1774, Long, in the *History of Jamaica*, bemoaned the fact that there was no botanic garden in Jamaica which could introduce new vegetable products into the island. He expressed surprise that the gentlemen of Jamaica should allow the small island of St. Vincent to be ahead of them in starting such an establishment. Long seemed to have stimulated the local gentlemen and, in 1777, Dr. Thomas Clarke was appointed the first Island Botanist. He brought with him a considerable number of plants well adapted to the two gardens proposed: one as a European and the other as a tropical garden". It was not, however, until 1779 that the first government botanic garden was started in Bath in the parish of St. Thomas. There was also at that time the Spring Gardens, privately

13. Powell, Dulcie: *The Botanic Gardens, Liguanea*. Institute of Jamaica, Kingston, Jamaica. 1972.

owned by Mr. Hinton East at Garden Town in the parish of St. Andrews. It was Mr. East who wrote to Sir Joseph Banks, then in charge of the Royal Gardens at Kew, in 1784 that "the acquisition of the best kind of Bread Fruit would be of infinite importance to the West Indies in affording exclusive of variety, a wholesome and pleasant food to our Negroes, which would have this great advantage over the Plantain Trees from whence our slaves derive a great part of their subsistence, that the former would be raised with infinitely less labour and not be subject to be destroyed by every smart Gale or Wind as the latter are". Arising from this correspondence and subsequent discussion in England with Sir Joseph Banks and the interest of Dr. Anderson at the Botanic Garden in St. Vincent, Captain William Bligh was sent out in the "Bounty" on his ill-fated first voyage to fetch these and other plants from the South Seas to St. Vincent and Jamaica. The second expedition of Captain Bligh to the South Seas was successful and the breadfruit, Bourbon cane and other plants introduced into St. Vincent and Jamaica in 1793. As a footnote to this event, Sturge and Harvey in *The West Indies in 1837* wrote "We breakfasted at the house of an old gentleman of the name of Wiles who was botanist on Capt. Bligh's expedition and came with him to Jamaica fortyfour years ago. He was induced by the assembly to remain and to undertake the superintendence of the Botanic Garden (at Bath), formed for the reception of the plants which they had brought.....He told us that the breadfruit tree has not succeeded so well as had been anticipated. It thrives in moist situations, but never reaches the luxuriant growth of its native climate. The most valuable tree, he said which has been introduced in Jamaica in recent times, is the mango: a few plants of which were taken out of a French prize captured about half a century ago by Lord Rodney. It has spread with great rapidity, and is now found in every part of the island; the fruit, which it produces in very great abundance, forms a dessert for the whites and food for the negroes, as well as for cattle, horses, and hogs". The reference here is to the French ship captured by Rodney's squadron in 1782 while on its way from Mauritius to Hispaniola with a consignment of plants including spices and mango which were presented to the Botanic Gardens in Jamaica and St. Vincent by Rodney.

Under the influence of Kew, Botanic Gardens were also established in British Guiana and Trinidad between 1820 and 1860 and placed under the charge of officers trained in botany and horticulture at Kew. The gardens in St. Vincent, however, was closed down in 1830 and as many plants as possible transferred to Trinidad.

The serious decline of the sugar industry towards the end of the nineteenth century led to serious consideration of the economic prospects of the Colonies and to the possibility of introducing other industries which might assist in supporting some of the Colonies even if they did not entirely replace sugar. The gardens had already proved their value by the introduction of many useful plants, notably additional varieties of sugar-cane, including the White Transparent which later was to replace the Bourbon cane when it broke down with disease.

In 1884, Mr. Donald Morris, then Director of the Botanical Department of Jamaica, had submitted proposals to the Colonial Secretary of Jamaica for the formation in each of the smaller islands of small botanical establishments which should be placed under the direction of some local officer and that they should serve as centres from which could be distributed such plants as might be successfully introduced and could be considered as the basis of new industries.

In 1885 Sir Joseph Hooker of Kew expressed the opinion that there could be no doubt that the future prosperity of the West Indies would be largely affected by the extension to the other islands, unprovided with any kind of botanical establishment, of the operation, so successfully pursued in Jamaica. It was also proposed that in addition to distributing plants, these central institutions should organise a regular system of botanical bulletins containing practical hints on the treatment of economic plants and the conditions under which they might best be utilised.

As a result, in 1887 Botanic Stations were established in Grenada and St. Lucia and one at Dodd's in Barbados where experiments with sugarcane breeding and other experiments had already been started by

Professor Harrison and Mr. J. R. Bovell. This latter was the first experiment station as such in the West Indies. In 1890, one was established in St. Vincent on part of the site of the old Botanic Garden and Stations were also established in Antigua (1890), St. Kitts (1891), Dominica (1890), and Montserrat (1890), while a chemical laboratory largely devoted to agricultural problems was established in Antigua.

According to Sir Francis Watts, "this period marked a definite advance towards the development of scientific agriculture in the West Indies. The botanical establishments thus created were closely associated with Kew and marked the transition period from botanical establishments to experiment stations; they were useful in that they paved the way for later developments."

The Royal Commission 1897

The worsening of the general economic conditions led to the appointment of the first Royal Commission to enquire into the conditions and prospects of the sugar-growing West Indian colonies, at the end of 1896. The Commission visited the West Indies in 1897 and reported in the same year:

"Briefly the position then was that, in all colonies where sugar was the principal industry, conditions were extremely bad, standards of cultivation had been reduced and fertility exploited to the utmost; manufacturing methods were inefficient, and although in British Guiana, Trinidad, and St. Lucia sugar factories had been established many of them were poorly equipped; elsewhere only muscovado sugar was made with its attendant great losses. Sugar properties without exception were heavily encumbered with debt and on the verge of bankruptcy. In Trinidad, Grenada, and Jamaica conditions were better, owing to the extension of cocoa cultivation in the two former and of banana growing in the latter. In Dominica prosperity was increasing owing to the extending cultivation of limes. Elsewhere the blackest depression was universal.

“Except in Jamaica and to a less extent in Trinidad and British Guiana peasant land ownership was negligible. It was fortunate that at that time there were considerable outlets for surplus population by emigration to the United States, the Panama Canal Zone and elsewhere in Central America which served to relieve to some extent the all pervading poverty and distress.”

The Royal Commission concluded that (a) if these conditions persisted much longer the sugar industry of the West Indies would be destroyed and, since it appeared that no other agricultural industry could completely and satisfactorily replace it, this would have a profound effect on the Colonies; (b) the British Government should make all possible efforts to secure the abolition of the sugar bounties; (c) every effort should be made to secure greater diversity of production in West Indian agriculture; (d) provision should be made by the British Government to enable peasants to acquire land, particularly in St. Vincent; (e) a department of scientific agriculture for Barbados, the Windward and the Leeward Islands should be established which would have advisory functions in relation to the other larger colonies; the cost for the first ten years to be met from Imperial funds.

The Imperial Department of Agriculture

The Imperial Department of Agriculture for the West Indies was established in 1898 with Dr. (later Sir) Daniel Morris as Imperial Commissioner with headquarters in Barbados. Other staff included a mycologist and an entomologist, the first Colonial appointments of this kind ever made. The Department assumed charge of the existing agricultural services mainly the Botanic Stations previously mentioned in Barbados, the Windward Islands, and provided a series of grants from Imperial Funds for experimental and development work in the larger territories.

Botanic Gardens and Experiment Stations

The Royal Commission stated that botanical institutions in the West Indies had played an important part in improving agricultural

industries and were capable of being made increasingly useful. Twenty years ago there were only three (British Guiana, Jamaica and Trinidad) such institutions in existence but now, owing to the organisation of the Botanic Stations there were thirteen of these institutions.

As the Colonies of Jamaica, Trinidad and British Guiana were in a position to maintain their own botanical establishments, no grants-in-aid were given them. The Botanic Stations of Tobago, Grenada, St. Vincent, Barbados, St. Lucia, Dominica, Montserrat, Antigua, St. Kitts-Nevis were placed under the direct charge of the Imperial Department and the cost of maintaining them paid from Imperial funds. They were to devote themselves in a systematic manner to the work of introducing, propagating and distributing all the promising economic plants of the tropics, including the improved varieties of sugar-cane. They were to act as centres for diffusing information and as training institutions and the headquarters from which agricultural instructors would be sent to give lectures and demonstrations on the selection of land for tropical economic plants, their suitable cultivation and the best methods for curing and packing the produce.

Agricultural Instructors

In regard to agricultural instructors, Dr. Morris said that considerable experience had shown that it was not sufficient to provide Botanic Gardens and Experimental Stations to influence the large body of cultivators in the West Indies. They must be reached in a more direct and effective manner. The first attempt to employ travelling instructors had been made on his recommendations in Jamaica in 1891 when two cocoa instructors were appointed: the results had fully justified the use of this method of assisting in the development of rural industries. He cautioned that great care was necessary in selecting men possessing the necessary qualifications and considered that in Dominica, St. Lucia and Grenada a knowledge of the local *patois* would be an advantage. He indicated guidelines for their *modus operandi*: it was important to arrange beforehand with the leading personages in each district, so that the people would be prepared to receive the instructor and made thoroughly acquainted with the objects of his visit. A public meeting

was a useful first step to be followed by visits to gardens and cultivated areas when he would be able to give practical demonstrations in the right methods of preparing the soil, in draining and manuring and in putting out the plants in a neat and suitable manner, and so on. The directives could hardly be bettered today.

An agricultural instructor was attached to each Botanic Station and an officer with similar training attached to the Agricultural Schools and where it was not possible to attach an instructor, the Curator in charge of the Botanic Station was required to undertake the duties. In addition instructors or experts with special experience in various aspects of agriculture were required to spend a month or two in each island. Dr. Morris felt that for some years to come the peripatetic instructors had to be relied upon "to carry out the large share of training necessary amongst the adult population of the community. In spite of the disadvantages incidental to their isolated position, these people are not slow to follow the advice given them once they are convinced of its practical utility and of its direct bearing upon their future welfare". If only all agricultural extension officers could be made to believe this!

Dissemination of Information

In addition to the employment of travelling instructors, the problem of isolation of the agriculturists was tackled by preparing and distributing bulletins, handbooks and leaflets. The principal publications were the *West Indian Bulletin*, a quarterly scientific journal containing matters of general scientific interest; the *Agricultural News*, a fortnightly review of the Department, dealing generally with agricultural matters with special reference to the West Indies; the pamphlet series of small booklets dealing in a popular manner with subjects of interest to agriculturists in the West Indies, including the sugar-cane experiments, insect pests, fungus diseases, the cultivation of cotton, onions, tobacco, limes, etc; leaflets issued as required; and annual reports on the Botanic and Experiment Stations and Agricultural Schools.

These agricultural institutions and services were steadily developed and by 1911, at the end of the first ten years of the life of the Imperial

Department, the botanical establishments in Barbados, British Guiana, Jamaica and Trinidad had been consolidated and organised into Departments of Agriculture, modelled on the lines of the Imperial Department and paid for out of their own funds. In most of the smaller islands Botanic and Agricultural Stations and education centres had been established under the aegis of the Imperial Department. Thus developed the first official agricultural services in the West Indies with modest provision for agricultural education and agricultural extension. The foundation was laid for the future expansion of these services.

1911-1921

During this period the West Indies recovered rapidly from the depression prevailing at the end of the nineteenth century. A large grant was made to the sugar industry by the British Government and the abolition of bounties eventually occurred in 1903. Cane-breeding work in Barbados was extended and supplemented with large-scale experimental work to improve cultural conditions. Central sugar factories were established in Antigua and St. Kitts-Nevis and the gradual conversion to central factories in Barbados was initiated. Sea-island cotton growing was introduced and rapidly replaced sugar-cane as the principal industry in Montserrat, St. Vincent and Nevis, and became an important subsidiary in Barbados, St. Kitts and Antigua. Lime cultivation rapidly increased in Dominica and St. Lucia. Although much of the development was in respect of estates, increasing attention was paid to peasant agriculture and land settlement on a considerable scale was established in St. Vincent.

Similar developments occurred in the larger colonies: cultivation of sugar-cane improved and new varieties were introduced and sugar factories improved with new machinery. In Jamaica, banana cultivation expanded rapidly under the stimulus of food prices in the United States and began to assume a dominant position. In Trinidad, the cocoa industry similarly expanded, on both estates and small holdings. In British Guiana, rice cultivation on abandoned sugar lands by immigrant Indians expanded considerably and rice exports began.

So successful was the Imperial Department that the British Government in response to popular demand decided to continue its work in the smaller territories by a series of diminishing grants which terminated in 1921. By that time, the 1914-18 war had caused an unparalleled increase in prices and in the immediate post-war years the colonies reached "a zenith of prosperity which had not been equalled since the abolition of slavery". This period of prosperity was short-lived, however, and by 1921 decline in prices commenced and another period of depression was ushered in.

West Indian Agricultural College

During the post-war period, agricultural services expanded considerably. In Trinidad, Jamaica, Barbados and British Guiana, staff were increased and their activities and services greatly expanded and many new lines of work undertaken. Greatly increased attention began to be paid to the needs of peasant agriculture. In the Windward and Leeward Islands, the Imperial Department of Agriculture was closed in 1921 with the termination of the Imperial grant-in-aid and its staff merged in the West Indian College, a grant-in-aid for the foundation of which in 1921 was made from Imperial funds on the understanding that it would continue to discharge the functions of the Imperial Department without any further addition to staff. This proved impracticable and these colonies received little in the way of advice or assistance up until 1928 when a special advisory branch of the College, which had been renamed the Imperial College of Tropical Agriculture in 1923, was established.

The steady increase in population led to the extension of peasant agriculture and this became more pronounced as the depression decreased: estate lands were increasingly sold or rented to small holders and there was a revival of interest in land settlement. The majority of the peasant holdings were small in size, usually two to three acres or less and devoted mainly to the growing of cash crops. Food production was still undertaken mainly on subsistence holdings in the mountain or bush under shifting cultivation.

The Royal Commission: 1938-39

The continued depression in the 1930s led to the despatch of yet another Royal Commission to the West Indies in 1938-39. Depressed economic conditions, the growing volume of unemployment, and the low standard of living of the masses of the people which had led to disturbances in a number of the colonies forced the metropolitan government once more to intervene. Conditions were not as bad as they had been at the end of the nineteenth century but political activity was at a greatly increased level and the clamour for independence was beginning to make itself heard.

The Royal Commission enquired into all aspects of life in the West Indies and made a large number of recommendations¹⁴ for improvement. Agriculture, of course, received special consideration and among those of particular interest for our present purposes were:

“Recommendation 20

“Agriculture is the principal source of sustenance and wealth in the West Indies and the standards of life must largely depend upon intensive use of the soil. The outstanding agricultural need in the West Indies is the more intensive use of land with increased production of food in order to support a rapidly growing population. The most urgent need is the development of peasant agriculture, but substantial progress among both peasants and estates is dependent upon far reaching reform of the basic methods now in vogue. The practice of shifting cultivation by peasant farmers must be abandoned and replaced by an organised system of permanent mixed farming; the present policy of those larger proprietors who grow a single crop continuously must be modified by the development of mixed farming in a measure which will vary from place to

14. West India Royal Commission, 1938-39: *Recommendations*. Cmd. 6174. H.M.S.O., London, 1940.

place with local circumstances. Neither of these reforms can be successfully carried through until new knowledge, which is obtainable only by scientific investigation, is obtained. War conditions will give an opportunity of which advantage should be taken for making an immediate start with both measures of reform."

"Recommendation 21(b): Regional Research Centre

"The centralisation of all major research and investigation at the Imperial College of Tropical Agriculture which would thus add to its present functions the duty of serving as a research station for the West Indies. The money required for this extension of the function of the ICTA should be provided by Parliament, which should be invited to ensure the continuance of the scheme for a number of years. The work of the Colonial Agricultural Departments should be concentrated on local replications of the central investigations and on advisory and educational work."

"Recommendation 21(c)

"The provision at the Hope Agricultural School, Jamaica, of facilities for all the West Indian Colonies for agricultural education at the stage immediately preceding that of the Diploma course at the ICTA which should continue to serve all its present purposes."

Recommendation 21(d)

Provided for a series of enquiries and investigations including a comprehensive soil survey of the West Indies; topographical survey; survey of peasant agriculture and investigations of better peasant farming systems; survey of soil erosion and investigations of methods of soil conservation and maintenance of soil fertility; investigation of marketing of estates and peasant produce and of the possibility of joint action by all the Colonies in both marketing and the allocation of production of certain products; investigation of possible systems of mixed farming in connection with sugar-cane and other crops; survey of agricultural indebtedness and credit.

“Recommendation 22

“The investigations mentioned above will doubtless show the need for a scale of expenditure far beyond the resources available to the Colonial Governments. We therefore recommend that a substantial sum should be allocated by the Imperial Exchequer for this strictly agricultural work. Expenditure could begin as soon as the first of the surveys recommended has been completed.”

“Recommendation 24: Land Settlement

- “(a) The order of priority should be, first, the improvement of the husbandry of existing small-holders in the light of some of the enquiries in 21(d) above; then, the improvement of existing land settlements and the establishment of new settlements;
- (b) Governments should not regard themselves as committed to freehold tenure but should experiment with both leasehold and freehold tenure,....
- (c) Government should take powers for the compulsory acquisition of agricultural land needed for land settlement and similar purposes;
- (d) It should be firmly impressed on settlers and others that, while credit facilities will generally be required in the early stages of any scheme of land settlement, their success depends in the last resort on their own exertions and that Government cannot continue to provide financial support indefinitely.”

The implementation of the recommendations was entrusted to a Comptroller for Development and Welfare, appointed under the provisions of the Development and Welfare Act, for action in consultation with the Colonial Governments. His headquarters were in Barbados and his advisory staff of specialist officers included an Inspector General of Agriculture for the West Indies.

Development and Welfare in the West Indies

The implementation of the recommendations of the Royal Commission were, of course, limited by the financial resources made available to the Comptroller and these do not appear to have been over-generous. It was reported for instance that considerable sums had been made available under the Colonial Development and Welfare Act: since this Act was passed assistance in respect of agriculture and veterinary schemes totalling £2,250,000 had been approved up to December 31, 1944, out of a total assistance of £7,700,000 approved for the whole of the West Indies during that period: not a princely rate of expenditure, but it must be remembered that in the early days at least, the rate was to quite an extent limited by the absorptive capacity of the Colony and this in turn depended on the availability of trained staff. The total expenditure increased with time, of course, and amounted to a very substantial sum by the time the Colonial Development and Welfare organisation was wound up in recent years. Even so, assistance has continued to be given to the Associated States and Colonies by the Ministry of Overseas Development through its Development Division which replaced the C.D.&W. organisation and like its predecessors is located in Barbados.

The Colonial Development and Welfare Act itself represented a new departure in Colonial administration which had previously been based on the policy that the Colonial Government was responsible mainly for the maintenance of law and order and the collection of taxes in order to provide the administrative framework needed for the functioning of primary industries and the export of their products to the metropolitan government. Any development needed must be paid for out of revenue and the colonies must be self-supporting. The Colonial Development and Welfare Act on the other hand was explicitly based on the policy that the Colonies were being held in trust by the metropolitan country for the benefit of the inhabitants of the Colonies and that these should therefore be developed in the best interests of the inhabitants with the cost being met by the British Government, if necessary, pending such time as they could be granted their independence. The smaller territories in the West Indies in particular benefitted from the C.D.&W. Act and the assistance

channelled through the Comptroller. Relatively large grants have been made available for infrastructure and institutional development.

With the emphasis placed on agriculture, and land settlement by the Royal Commission, particular attention was paid to their needs and special efforts made to organise and staff the Agricultural Departments adequately for these purposes. It can be said, I think, that the Departments are now reasonably well staffed bearing in mind the recurrent cost of maintaining these Departments in relation to the financial resources of the territories.

The larger territories, Barbados, Jamaica and Trinidad and Tobago, have fully staffed Government Departments of Agriculture, complete with administrative, research and extension officers. The research officers undertake mainly applied research and, except in the case of Jamaica, double as subject-matter specialists available for consultation and advisory work in collaboration with the extension staff.

Agricultural Extension in Jamaica

In Jamaica, extension development took a rather different course from that in the other territories. There the Jamaica Agricultural Society established in 1895 was responsible for agricultural extension from there until 1951 when the extension staff was transferred to the Department of Agriculture. The Jamaica Agricultural Society is a farmers' organisation financed by an annual subvention from Government and subscription from members' revenue from the sale of farm supplies to its members. By the time the service was transferred to Government, the Society had built up its extension staff to some 65 agricultural instructors, and it was the most highly developed agricultural extension service in the region. The subsequent history of agricultural extension in Jamaica is rather chequered. In 1955, an attempt was made to coordinate the programmes by the various government and other agencies engaged in adult education to form an integrated rural development programme. Some measure of success was achieved but conflicts between agencies and field staff of agencies inevitably arose. Moreover, it was found that the

agricultural extension staff were not engaged primarily in educational work but were heavily burdened with regulatory and statutory work. This led to the reorganisation of the Extension Service in 1964: it was divided into Development and Advisory branches and the island divided into 33 ecological areas and staff redeployed accordingly. A further change took place more recently when the Extension staff was transferred to the newly established Ministry of Rural Land Development, formed by splitting the Ministry of Agriculture and Lands into two Ministries.* Extension staff were then redeployed to the development areas into which the island had been subdivided, each under the control of a Land Development Authority.

While it may be true that re-organisation may be only a more rapid phase in the continuous evolution of any organisation, the somewhat frequent and rather drastic changes to which the Extension Service of Jamaica has been subjected in recent years must have had a prejudicial effect on the Service and on the morale of its officers. The original organisation of the Extension Service in Jamaica is unique in the West Indies and appears to have been based on the pattern found in some European countries, e.g. Denmark.

In the other Commonwealth Caribbean territories, the organisation has so far tended to follow somewhat the British type of organisation: that is, the extension or advisory services, with possibly one exception, form part of the Agricultural Departments within the Ministries of Agriculture. In a typically small island like St. Vincent, the territory is divided into two areas on a geographical basis, i.e. the Leeward and Grenadines and the Windward, each under an Agricultural Officer. The areas are sub-divided into districts, again on a geographical basis with some prominent topographic feature acting as boundary lines; each district is under the charge of a Senior Agricultural Instructor with one or more Assistant Agricultural Instructors under him depending on

* More recently the two Ministries have been merged into one Ministry of Agriculture and the various services, including extension, re-organised somewhat.

the geographical size of the district, its topography, road communications, and number of holdings, typically 600 to 1,000 small-holdings of less than five acres each and one or more estates of 100 acres or more. Supporting this organisation are a number of research officers with access to a government experiment station and other specialist officers as well as headquarters administrative staff. Normally, the Senior and the Assistant Agricultural Instructors are resident in their districts. These are the front-line extension workers in direct contact with the farmers.

The clientele of the district staff are the 600 or so small-holders with holdings ranging from a half acre to usually not more than five acres. They are typically past the middle age, since very few young people stay on these small-holdings, and mostly illiterate or functionally illiterate.

The Assistant Agricultural Instructor is usually a young man recruited in the rural areas with some knowledge of farming but little formal education, rarely up to "O" level secondary education, and no formal agricultural training. The Senior Agricultural Instructor has probably been promoted "from the ranks" because of long service or he may have received formal agricultural training at the Jamaica School of Agriculture or the Eastern Caribbean Farm Institute. The Agricultural Officer is usually a young university graduate: UWI B.Sc. Agriculture or similar qualification.

It is easy to understand that considerable difficulty of communication could arise between the front line local extension workers and the small-holders. Personal contact has been extensively relied upon for passing on information to the farmers but this has obvious limitations: the district is large, topography and road conditions difficult, the farmer old, conservative and suspicious of innovations, the local extension worker poorly trained in agriculture and in the art of personal communication. It is hardly surprising that many local extension workers visit as few farmers as possible.

To be successful under these conditions, the local extension worker must have some tried and successful innovation to demonstrate to the small-holder or is in a position to bring in a subject-matter specialist to deal with specific problems. His life is a difficult one and he is frequently accused of driving around in a motor-car and refusing to "dirty" his hands. I do not know that trying to cover a large district on a donkey would be any more successful. A technique that has proved successful when there is some innovation which has been proved by research to be valuable is to persuade one of the more influential and progressive small-holder to permit a demonstration of the innovation, perhaps a new fertiliser mixture or plant protection measure, on his holding, guaranteeing him against financial loss and meeting all the costs additional to his normal practice. A successful demonstration impresses not only the farmer concerned but his neighbours as well.

Better education and training of the Assistant Agricultural Instructors would certainly help and it is encouraging to note that more of them are receiving training at the Farm Institutes in Jamaica and Trinidad. Also, the Agricultural Extension Department of the Faculty of Agriculture is assisting by mounting annual in-service training courses in the Windward and Leeward Islands for the junior agricultural staff.

Clearly, however, mass communication methods must be used if diffusion of information is to be successful on a large scale. The problem here, however, is that we know little about the communication process under West Indian farming conditions. We know the methodology and techniques that have proved successful in North America and Europe, but here in the West Indies we are dealing with a different type of clientele and experience so far has shown that methods successful in other areas may not be so under ours. The Extension Department of the Faculty has also recognised this problem and with the generous assistance of the Research Division of the Ministry of Overseas Development a Windward Islands Extension Communications research project is shortly to be undertaken

under the direction of Dr. Thomas Henderson, Head of the Department. It is a two-year project and we hope to know a good deal of the communication process under West Indian conditions when it is completed.

Another factor which tends to militate against the success of extension work is that the local extension worker is frequently asked to undertake regulatory and service duties in addition to or instead of the educational work he should be concentrating on. Regulatory work, such as is involved in the administration of agricultural legislation, e.g. plant protection legislation and subsidy payments, tend to bring the extension worker into conflict with his clientele for obvious reasons. Performing "service" functions for the farmer, especially the large landowner and other influential persons, also tend to cause conflict within the extension worker since, though he would like to please these influential persons in the interests of his work, he realises that he is being exploited as a cheap source of labour. Dr. Henderson has written a most interesting paper on this topic¹⁵ and I heartily recommend it to anyone who is interested. Unfortunately, because of shortage of staff, agricultural administrators frequently require their front-line extension workers to undertake regulatory and service functions. They should clearly understand, however, that this can only be at the expense of the education function and is harmful to the Extension Service as a whole. These practices must be eliminated if the Service is to achieve its basic purpose of educating people to help themselves.

A complicating factor in all this is that the administrator may feel that the extension worker does not have sufficient to do or the extension worker himself may think so. This usually arises from the

15. Henderson, T. H.: *Conflicts in the Role of the Agricultural Extension Officer in the Windward Islands*. Extension Bulletin No. 1. Department of Agricultural Extension, UWI, St. Augustine.

fact that few Extension Services in the West Indies undertake Programme Planning and Programme Evaluation. As Dr. M. O. Watkins¹⁶ emphasised "there is no substitute for planning with the people on what they wish to accomplish. A programme is pretty sterile and there is not much interest or enthusiasm for carrying out a campaign to get something done which the people are not interested in. We therefore spend a great deal of time trying to find out from the people what they consider their problems to be, what their goals and objectives are in agriculture, and then attempt to structure a programme which will solve these problems and help the people to reach these goals". Unfortunately, Programme Planning and Evaluation has been neglected by the Extension Services of the Commonwealth Caribbean with the exception of Jamaica. It is no wonder that an Agricultural Instructor once told me that without subsidy payments there would be nothing for him to do. An Extension Service without Programme Planning is like a ship without a rudder, and little real accomplishment can be expected.

Although we now have a reasonable structure for agricultural extension in the West Indies, there are serious deficiencies. As was emphasised earlier, experience has shown that a close connection between Teaching, Research and Extension is necessary to secure the maximum benefits from each. We now have the Faculty of Agriculture offering agricultural extension as part of its B.Sc. Agriculture Programme, as well as post-graduate programmes in this field. We are now, therefore, in a position to produce qualified Agricultural Extension Officers. We also have, through the recommendation of the Royal Commission 1938-39 and the financial contributions of the Governments of Barbados, Jamaica, Trinidad and Tobago, and for the time being Britain, the Regional Research Centre attached to the

16. Watkins, M. O.: Op. cit.

Faculty of Agriculture serving "as a research station for the West Indies". Finally, we have the various Agricultural Extension Services of the Ministries of Agriculture, albeit not forming part of the University structure, but nevertheless working closely with the Extension Department of the Faculty of Agriculture. There is however, nobody of subject-matter specialists either at the University or in the Ministries of Agriculture to act as a link between the research workers of the University and the Regional Research Centre and the Extension staffs of the Ministries of Agriculture and to be available for consultation and advice when required by the local extension workers. No funds have ever been provided for the creation of such a body of specialists. The funds available to the Regional Research Centre will not permit this, nor could University staff or the research workers of the Centre be diverted from their research to undertake the duties of subject-matter specialists without seriously harming their research programmes, except perhaps for very short periods.

The Commonwealth CARIFTA Secretariat has been approaching this problem from a slightly different viewpoint and has been seeking financial assistance for the establishment of a "fire-brigade force" of specialists for work in the less developed countries of the Commonwealth Caribbean. Where this force would be stationed, if funds can be obtained for its establishment, has not been settled but there is a danger that we might have a disruption of the links of the Teaching/Research/Extension chain, so far established, if such a body of specialists does not work in close collaboration with the University and the Regional Research Centre.

Another defect in our extension work in the region is the fact that our Agricultural Extension Services deal only with the farmer and

not with the farm family as a whole. We tend to ignore the fact that the family is an integral part of the farm business and must be given as much consideration by the Extension Service as the farmer himself. To enable this to be done would need staff trained in Home Economics and Nutrition but there are few such in the Agricultural Departments of the region and the Faculty of Agriculture has so far no facilities for teaching or research in these fields. Proposals for the establishment of a Department of Home Economics in the Faculty of Agriculture were submitted to the Heads of Governments meeting in Trinidad at the end of 1972 but consideration was deferred pending the results of manpower surveys to be undertaken by the Governments to determine their manpower requirements in this and other fields. These manpower surveys are now being organised and, hopefully, the results will convince the Governments of the need for Home Economics staff to complement Agricultural Extension staff in their work with farmers and their families.

Conclusion

In conclusion, I should like to say a few words on how I see developments in the Commonwealth Caribbean affecting the Agricultural Extension Services in the future. We are all, I am sure, acutely aware of the crisis through which agriculture is passing – it is clear that the masses of the people have rejected agriculture as a way of life and agricultural employment as a satisfactory means of earning a cash wage. There are many reasons for this attitude which is particularly marked among the young people. Farming involves hard work for low remuneration; the average size small-holding is too small to be economic or provide a satisfactory income except for certain very specialised types of farming, like vegetable production; agricultural labour is not acceptable because of its historical past; wages are too low, and so on. There is, in my opinion, a good deal of merit in the arguments of the young people against entering agriculture as at present organised, and what is needed to change this attitude is nothing short of an agricultural revolution based on land reform.

Under such a programme, there would be consolidation of the uneconomic mini-holdings and a break-up of the large units into family-sized holdings capable of providing a reasonable level of living for the family with suitable mechanisation of the farming operations. It is futile to keep on expecting agriculture to solve the unemployment problem, to increase food production and to attract young people back to the land all at the same time. Increasing agricultural efficiency and thus its attractiveness as a business opportunity for young people must inevitably mean few people engaged in farming. One way of achieving the objectives of a prosperous and therefore efficient agriculture would be by the establishment of family farms through a programme of land reform. There are, of course, other possible forms of organization, e.g. cooperative forms, group forms, etc.

If programmes of land reform are undertaken throughout the area, clearly there will be greatly increased need for larger numbers of better trained agricultural extension and home economics workers. I think these changes are inevitable and I suggest we should now start preparing for them in our Teaching, Research and Extension programmes.

St. Augustine
June 27, 1973

**ELEVENTH MEETING OF THE CARIBBEAN FOOD CROPS SOCIETY
1st — 7th JULY, 1973 — BARBADOS**

LIST OF DELEGATES

<i>Country</i>	<i>Name</i>	<i>Country</i>	<i>Name</i>
ANTIGUA	C. J. Walter		E. C. Patterson
			D. Payne
BARBADOS	W. deC. Jeffers		E. Payne
	M. M. Alam		C. E. Pilgrim
	S. Blades		R. C. Quintyne
	E. Brathwaite		D. Rawlins
	A. Bryan		DeC. Sealy
	M. T. Burke		L. W. Small
	I. Chandler		L. H. Smith
	F. Chandler		G. McD. Taylor
	K. Chase		C. Trotman
	V. M. Corbin		P. Webster
	E. Cumberbatch		J. A. L. Worme
	O. Davis—Isaacs		
	C. Fraser	DOMINICAN	
	J. Garvey	REPUBLIC	R. DeCock
	J. Grace		
	F. Greene	DOMINICA	C. J. L. Dupigny
	O. Hamilton		C. Jno-Baptiste
	W. Harvey		
	W. Headley	FRENCH	
	R. M. Hoad	GUYANA	P. Blancaneaux
	J. P. W. Jeffers		J. Brochier
	D. M. Knight		
	R. D. Lucas	GRENADA	G. Barriteau
	D. Marsh		A. Cape
	G. Mason		
	G. Morris		
	O. O. Parris	GUADELOUPE	G. Anais

<i>Country</i>	<i>Name</i>	<i>Country</i>	<i>Name</i>
GUYANA	H. A. D. Chesney R. O. Hart Omawale	U.S.A.	T. W. Scott
JAMAICA	H. A. Beckford A. U. Cameron H. B. Crawford* J. H. Donaldson H. A. Fraser I. Goodison* H. Miller A. Naylor* D. C. Stanford	U. W. I.	G. Avril R. A. Baynes C. Brathwaite R. A. I. Brathwaite A. C. Brewer T. Fergusson Dr. St. C. Forde J. Hammerton C. McIntosh C. K. Robinson N. D. Singh B. G. F. Springer
MARTINIQUE	G. Rimbaud J. Thonet		
MONTSERRAT	J. H. Green	PUERTO RICO	G. C. Jackson* E. R. Kiel* M. A. Lugo-Lopez* G. Samuels*
ST. CROIX	E. Hall D. S. Padda H. Schuster F. B. Sands*		
ST. VINCENT	G. White	B.D.D.	E. Metcalf E. T. Wilmot
TRINIDAD	L. Cross* F. B. Lauckner D. D. Oudit C. K. Robinson G. M. Shekour	C.D.B.	E. G. B. Gooding V. Sargeant J. B. Yankey

* Accompanied by wife or husband.