

SOME NOTES AND SOME COMMENTS

ON

BUREAU HISTORY

## FOREWORD

The historical notes which follow are necessarily brief; and Bureau staff will find considerably more detail, on some aspects, in "Fifty Years of Scientific Progress" and in the Annual Reports and Technical Communications which have been published.

These notes are of a general nature; they do not pretend to be a history. History has a habit of being mislaid or forgotten if not put down on paper; the problem is to find time to collate and record the material.

Considerable reference has been made to our Annual Reports; some of the very early information has come from Government files; and, in the more recent decades, there has been some dependence on memory - with all the dangers which that implies.

Bureau staff have reason to be proud of their organization - it is the best of its kind in the cane-sugar world. This eminence has not been achieved easily; and the credit goes to its individual staff members over the past seventy-one years, to its organization and administration, to the team work and dedication of the entire group, and to the industry which has so loyally supported it.

Norman J. King.  
Director.

CONTENTS

	<u>Page</u>
The Act and Its Origins	1
Dr. Walter Maxwell - First Director	3
The Sugar Experiment Stations Act of 1900	4
Harry T. Easterby	8
Dr. H.W. Kerr	11
Arthur F. Bell	13
Edmond R. (Rolly) Behne	16
Norman J. King	17
Decade by Decade	18
The First. 1901 to 1910	18
The Second. 1911 to 1920	19
The Third. 1921 to 1930	23
The Fourth. 1931 to 1940	29
The Fifth. 1941 to 1950	34
The Sixth. 1951 to 1960	39
The Seventh. 1961 to 1970	45
Head Office, the Pathology Farm and the Experiment Stations	50
Head Office	50
The Pathology Farm	51
Mackay Experiment Station	54
Bundaberg Experiment Station	57
Meringa Experiment Station	61
Lower Burdekin Experiment Station	65
Tully Experiment Station	69
The Smaller Centres	72
The Bureau as a Training Ground	74
Overseas Training, Commissions and Experience	76
The Bureau Levy	77
Bureau of Sugar Experiment Stations Buildings	80
Cane Pest and Disease Control Boards	81
The I.S.S.C.T.	85

## SOME NOTES AND SOME COMMENTS ON BUREAU HISTORY

### The Act and Its Origins

The bald statement that "The Sugar Experiment Stations Act received Royal assent on December 14th, 1900" fails to convey any information on the reasons leading to that important event. Some of these are set out below.

Seventy-one years constitute a lengthy period in any organization. The Bureau is not as old as the Australian sugar industry itself, but it is the first established of the sugar organizations in Queensland. The Australian Sugar Producers Association was established in 1907, the Central Sugar Cane Prices Board in 1915, the Sugar Board in 1923, the Queensland Cane Growers' Council in 1926, the Proprietary Sugar Millers' Association in 1927 and Sugar Research Limited in 1949.

The industry had agitated for many years for the establishment by the State Government of experiment stations. In 1885 the then Under Secretary for Agriculture (Mr. Peter McLean) advocated two State Nurseries at The Lagoons, Mackay, and Kamerunga, near Cairns to be used for sugar cane and other tropical crops; these came into being in 1889 and 1891 respectively. They functioned to the advantage of the industry for several years, and both the Cowley and the Tryon cane collections were grown at, and distributed from, those centres.

However, the industry continued to criticise the lack of research and experimental operations at those nurseries, and it fostered the desire to have sugar experiment stations and laboratories along the lines of some overseas countries. It is pertinent to mention at this point that the only sugar producing countries to have experiment stations earlier than Queensland were Louisiana and Java (dating from 1885), Hawaii in 1895, and St. Kitts in 1899.

Both Henry Tryon, Government Entomologist and Pathologist, and J.C. Brunnich, Agricultural Chemist, warmly supported the sugar industry and, in 1898, the Minister for Agriculture, the Hon. A.J. Thynne, agreed to add a laboratory to the State Nursery at Mackay.

This provided only temporary appeasement to the industry and, resulting from increased pressure, the State Nursery was done away with in 1899 and the site allocated fully for sugar experimental work.

It was in that lastmentioned year that the sugar industry took its final step to achieve its wishes. Led by the Bundaberg Planters and Farmers' Association, the growers approached the Government to invite Dr. Walter Maxwell, then Director of the Sugar Experiment Station of the Hawaiian Sugar Planters' Association, to visit Queensland to advise on the industry here. After some quite hurried arrangements the Government issued the invitation and Dr. Maxwell arrived in Queensland on December 9th, 1899. Following is reproduced a photocopy of a letter in Dr. Maxwell's handwriting, in which he accepted the invitation.

TRUSTEES  
J. F. MACHVELL  
SCHAEFER, P. C. JONES  
ATKINSON, C. HOLTS,  
SMITH, W. G. LEWIS  
BALDWIN, A. YOUNG

Experiment Station and Laboratories  
of the  
Hawaiian Sugar Planters' Association.

WALTER MAXWELL  
DIRECTOR  
AND  
CHIEF CHEMIST  
J. T. CANNON  
1-14 ARNOLD STREET

Honolulu, H. I. Sep. 18 1899

Hon. J. B. Chataway  
Secy. for Agriculture  
Queensland

Dear Sir

Since my letter, dated Sep. 1, was written by your circumstances have made it more favorable for my being able to get away for a period of say two to three months. In fact it is now practically certain that I can do so.

I write you immediately thus to save time, and because I can only be absent between Dec. 1 and March 1. I therefore beg to suggest ~~that~~, providing your people still desire me to visit them, that no time shall be lost in conveying to me your definite proposals in order that I may be able to make necessary arrangements.

I am Sir,  
Yours very truly  
W. Maxwell

When one considers that governments are reputed to move slowly, and that the knots in red tape are sometimes difficult to unravel, the progress at that time must have broken some records.

Dr. Maxwell arrived in Brisbane	December 9th, 1899
He left for sugar industry tour	December 15th, 1899
He submitted his report to Government	January 30th, 1900
Government wrote to Dr. Maxwell offering the position of Director	March, 1900
Dr. Maxwell accepted, and took up post	November, 1900
Sugar Experiment Stations Act passed	December, 1900

The original Act was a brief one and it is reproduced in full in these pages. Its three pages sufficed for that time, but it contrasts strangely with the 100 pages of Act and Regulations of to-day.

#### Dr. Walter Maxwell - First Director

It is a matter of official record that Dr. Maxwell was appointed as the Bureau's first Director on a salary of £3,000 per annum. The story has frequently been told that, during the negotiations, the State Government sent a cable to Dr. Maxwell asking what salary he would require to become Director in Queensland. He is reputed to have cabled in reply "Three thousand a year". He meant American dollars, but the Government assumed that he was requesting £3,000, and accepted his terms.

The Bureau has no evidence to support this story, but it is perhaps significant that, in that same year, the Premier of Queensland received a salary of £1,300, and the Ministers of the Crown were paid £1,000 per annum. And Dr. Maxwell's appointment was to a Government position!

It is also a matter of official record that the next senior officer in the Bureau, second in seniority to the Director, received a salary of £125 a year.

And although, particularly in those days, an overseas sugar expert was looked upon as someone quite superior to a local man - and could be expected to be paid a salary which was disproportionate to his opposite numbers in other primary industries, - it is of interest to make some comparisons. In 1933, some thirty-three years later, the Director of Sugar Experiment Stations in Queensland was on a classification of £600-£800 per annum, less 16 per cent.

# Queensland.



## An Act to Provide for the Establishment and Control of Sugar Experiment Stations.

64 Vic. No. 17.  
THE SUGAR  
EXPERIMENT  
STATIONS ACT  
OF 1900.

[ASSENTED TO 14TH DECEMBER, 1900.]

**B**E it enacted by the Queen's Most Excellent Majesty, by and with the advice and consent of the Legislative Council and Legislative Assembly of Queensland in Parliament assembled, and by the authority of the same, as follows:—

1. This Act may be cited as "*The Sugar Experiment Stations Act of 1900.*" Short title.

2. In this Act, unless the context otherwise indicates, the following Interpretation. terms have the meanings set against them respectively, that is to say—

"Minister"—The Secretary for Agriculture or other Minister of the Crown charged for the time being with the administration of this Act;

"Sugar Works"—Any mill for the extraction of sugar-cane juice;

"Sugar-cane received"—Sugar-cane delivered at a sugar works and accepted;

"Owner"—The owner, whether jointly or severally, of any sugar works, or the authorised agent of the owner, or the manager or person in charge of the works;

"Fund"—The Sugar Fund established under the provisions of this Act;

"Director"—The Director of Sugar Experiment Stations appointed under the provisions of this Act.

3. The Minister may from time to time establish, maintain, and manage such and so many Sugar Experiment Stations as in his opinion are necessary, and may provide and equip the same with all buildings, laboratories, machinery, instruments, apparatus, and all other matters and things necessary or proper for conducting experiments in connection with sugar-cane and sugar and the by-products thereof, and for preventing the spread of disease in cane, and otherwise for promoting the well-being of the sugar industry. Power to establish Sugar Experiment Stations.

4. The Governor in Council may from time to time appoint a Director of Sugar Experiment Stations, and may out of the Fund pay to such Director such salary and allowances as he thinks fit. Appointment of Director and officers.

The Director may, with the consent of the Minister, from time to time appoint such inspectors and other officers as may be necessary for the effectual execution of the provisions of this Act, and may out of the Fund pay to such inspectors and officers such salaries and allowances as he thinks fit.

5. The Director shall have the general direction, care, and control of all such Sugar Experiment Stations. Powers and duties of Director.

The Director shall from time to time make or cause to be made such inquiries, researches, and investigations as are directed by the Governor in Council or the Minister, and also such other inquiries, researches, and investigations as he thinks fit in relation to any matters concerning the sugar industry.

2

**Sugar Fund.**

6. There shall be established at the Treasury a Fund, to be called "The Sugar Fund," out of which shall be paid all expenses incurred by the Governor in Council or the Minister or the Director in the execution of this Act.

All assessments levied and other moneys received under the provisions of this Act shall be paid into the Fund.

**Assessment.**

7. The Minister may, in each year, make and levy an assessment not exceeding one penny on every ton of sugar-cane received at a sugar works. Such assessment shall be paid to the Minister in the first instance by the owner of every sugar works upon the actual number of tons of sugar-cane received during the season with respect to which notice of assessment has been given as hereinafter provided.

But such assessment shall be paid and borne by the owner of the sugar works and the grower of the cane, respectively, in equal proportions of not exceeding one halfpenny for every ton of such sugar-cane so received.

Notice of such assessment shall be given to all owners of sugar works before the thirty-first day of May in each year, and such assessment shall be paid by them to the Minister on or before the thirty-first day of January following.

The amount of every such assessment shall be a debt due from the owner of the sugar works to the Minister, and may be recovered at the suit of the Minister or other person appointed by him in that behalf by action in any court of competent jurisdiction:

Provided that the owner of the sugar works shall be entitled to deduct from any moneys due by him to the grower of the cane the amount of such assessment payable by such grower, and such amount shall be and remain a charge upon such cane and the resulting sugar and by-products thereof, notwithstanding any change that may take place in the ownership of the same; or he may recover such amount from such grower by action in any court of competent jurisdiction.

**Returns.**

8. For the purpose of enabling the Minister to ascertain the amount of the assessment payable by owners of sugar works, each such owner shall once in each year furnish to the Director a return of the weight of all sugar-cane received at the sugar works whereof he is owner, and the names and addresses of the respective growers thereof. Every such return shall be certified to be correct under the hand of the owner of the sugar works.

Any officer of the Government authorized by the Director in that behalf shall be permitted at all reasonable times to examine and test any weighbridge or other weighing instrument at any sugar-mill, and to inspect the books of every such owner relating to the receipt or purchase of sugar-cane for the purpose of verifying such returns, and to make any copy or take any extract therefrom.

No such return or copy or extract from such books shall be made public without the sanction of the Governor in Council.

**Endowment.**

9. In every year there shall be paid by the Treasurer into the Fund from the Consolidated Revenue, which is hereby appropriated for the purpose, a sum equal to the amount of assessments levied in such year:

Provided that until the payment into the Fund of the first annual assessment to be levied under the provisions of this Act the Governor may, by warrant under his hand, authorise the Treasurer to pay into the Fund out of the Consolidated Revenue on account of the endowment to be payable under the foregoing provisions a sum sufficient for defraying the necessary expenses incurred in the execution of this Act, and credit shall be given to the Treasurer for any sum so advanced.

10. In every year the Director shall furnish a report to the Minister upon the Sugar Experiment Stations under his control, and the administration of the Fund, and generally upon the condition of the sugar industry in Queensland Director to report annually.

Every such Report shall be laid before both Houses of Parliament.

11. The Governor in Council may from time to time make regulations Regulations. for the purpose of carrying into effect the provisions of this Act

Such regulations may impose a penalty of not exceeding twenty pounds for any breach thereof, and all such penalties may be recovered in a summary way before any two justices.

All such regulations shall be published in the *Gazette*, and thereupon shall have the force of law. All such regulations shall also be published in one or more newspapers circulating in the districts in which an assessment is made.

All such regulations shall be laid before both Houses of Parliament not later than fourteen days after the publication thereof, if Parliament is then in session, or, if not, then not later than fourteen days after the next session of Parliament.

If either House of Parliament within the next subsequent forty days resolves that any such regulations ought to be annulled in whole or in part, such regulations or part thereof shall, after the date of such resolution, be of no effect, without prejudice to the validity of anything done in the meantime under the provisions of such regulations.

There is no doubt that Dr. Maxwell occupied a prestige position in the Australian sugar industry. Partly because he was an imported scientist, with some reputation, and partly because there was no other technical sugar authority in Australia, he was used widely in both State and Federal Government circles for economic and scientific advice on sugar affairs.

During his term of office of some eight and a half years as Director of Sugar Experiment Stations, he also occupied, for part of the time, the position of Comptroller of Central Sugar Mills.

There is a dearth of written material on the personality of Dr. Maxwell and few, if any, sugar contemporaries of his are alive to-day. He was undoubtedly a controversial character, but this would appear to have been in his sugar-political activities rather than in connection with his technical work in the Bureau. By training, Maxwell was an agricultural chemist and he was strongly imbued with the thesis that a sick soil was the source of all plant evil. When writing in Queensland on the ravages caused by white grubs he stated "The examination leaves no doubt in the matter that the continuous ratooning, for successive years, and the dead condition and fouling of the soil, which, after one or two crops, it involves, provides all the most favourable conditions for the propagation of the grub and furnishes another powerful reason for the introduction of a more rational and thorough system of cultivation."

He also made the following remarks when discussing diseases and pests - "Quite certainly, any remedial steps taken for the rebuilding up of the producing power of the soil, and of the vitality of the cane, will also be actions begun for the resistance and removal of pests and diseases."

But to return to the man, and the reputation he left behind him. The Australian Sugar Journal is almost our only source of reference, and it began publication only in April, 1909 - the month following Maxwell's departure from Queensland. In the October, 1909 issue the following appeared :-

"A brief announcement has appeared in the press to the effect that Dr. Maxwell has agreed to act as special adviser to the Commonwealth Government in the matter of sugar growing. The statement will not be received with any enthusiasm in Queensland; because there are few, if any, of the

men identified with the industry who appreciate in any sense the advice which Dr. Maxwell has previously tendered to the Government on these subjects. If the Government are in need of any special advice on these matters, why should they not seek to obtain someone in whom the growers themselves have confidence . . . . Previous announcements have indicated that Dr. Maxwell will only be called in when some special occasion may arise. Thus, he would be more than ever out of touch with the districts to be served; and it is to be feared that the consulting brief he appears to hold from the Victorian State Government in the interests of beet sugar will still further interfere with any help that he might render the cane-growing interests of Queensland. There is, we protest, no need for an adviser; and if there were, Dr. Maxwell is certainly not the man who should have been selected. Queensland sugar growers have long ago weighed him in the balance and found him wanting."

The next information we have on Dr. Maxwell was published after his death, which occurred on July 9th, 1931. In 1932 the Hawaiian Planters Record carried a biographical note written by C.A. Browne. In this he stated inter alia - "Upon his resignation from the Directorship of the Bureau of the Australian Experiment Station, Dr. Maxwell was appointed a special agent of the U.S. Department of Agriculture for the purpose of studying the sugar cane industry in the Philippine Islands . . . . In the period of his greatest productivity Dr. Maxwell was a most aggressive worker. He was a man of broad vision, and the agricultural experiment stations he established in Hawaii and Australia have developed into institutions of the first rank."

#### Harry T. Easterby

In the first year of the Bureau's existence, Mr. Harry Easterby was appointed Assistant Director with headquarters at the old Mackay Experiment Station at The Lagoons - opposite the present site of the Sugar Research Institute. The arrangement came about in this way. Immediately after Dr. Maxwell's appointment, he prepared plans for a soils laboratory and Bureau headquarters at Bundaberg, and the Government Works Department completed the building in August, 1901. It occupied the site on the Burnett River now occupied by the Lands Department building.

This headquarters and laboratory was occupied by the Director, the Secretary, and the assistant chemists, while the Mackay Station performed the basic investigational work on variety testing, manurial trials, cultivation experiments, etc.

In the absence of any other experiment stations, a system of cane-growers' substations was inaugurated - stretching from Mossman to Nerang - and these served for the conduct of field trials on a wide range of subjects, and under the varying soil and climatic conditions of the State.

It is apparent from the wording of early reports that Mr. Easterby assumed an increasing responsibility for the operation of both the Mackay Station and the many field trials in the other areas, due in no small measure to the extra responsibilities which the Director assumed in other avenues of sugar work.

When Dr. Maxwell relinquished the Directorship in 1909 some marked changes became apparent in Bureau administration. For nine years it had apparently functioned as an autonomous institution, even though dependent on industry monies and Government subsidy. There would appear to have been a minimum, if not an absence, of Department of Agriculture intervention.

But, in 1909, the Bureau came into direct relationship with the Department for the first time. The Under Secretary, Mr. E.G. Scriven, was named Director of the Bureau, while Easterby continued as Assistant Director, and this major change in direction undoubtedly had some bearing on Mr. Easterby's decision to resign in the following year and to take up a position with the sugar-beet industry in Victoria.

He was away for only two years, during which period Dr. A.J. Gibson of the well-known Gibson family of Bingera Mill and Plantation was appointed General Superintendent.

When he returned in 1912 Mr. Easterby was appointed General Superintendent, but resident at Bundaberg where he continued for a few years before the Bureau administration was transferred to the Department of Agriculture and Stock building in Brisbane. Easterby continued as General Superintendent until 1922, when he was appointed Director, and continued in the latter position until his death in 1932.

In 1929 Mr. Easterby was a delegate to the I.S.S.C.T. Congress in Java. His history of the Queensland sugar industry, completed just before his death, is still a standard of reference.

It was during Easterby's occupation of the Directorship that a step was taken which perhaps did more to mould the Bureau's future as a scientific institution than did any other single decision. The then Chief Justice McCawley, who was a Senator of the Queensland University suggested to the Minister for Agriculture that three 3-year scholarships be awarded, the holders to undertake to work in the sugar industry for three years after their courses. Mr. Easterby, when this recommendation was referred to him, quickly recognized the advantages that would accrue to the Bureau and he therefore recommended that three selected graduates in various disciplines be send abroad to study soils and agriculture, plant pathology and mill technology respectively. The selection was made in 1924, and resulted in H.W. Kerr, A.F. Bell and Norman Bennett being awarded the scholarships.

On their return to Australia in 1928 these three gentlemen took charge of the three newly formed divisions in the Bureau framework.

Easterby, from 1912 to 1932, played a major part in laying foundations for later development. In those formative and exploratory years much progress was made in varietal improvement and cultivation studies. His staff was small and facilities limited, but he succeeded in establishing the organization as a technical reference point. Under his jurisdiction the Bundaberg and South Johnstone Experiment Stations were established, as well as the entomological centre at Nelson (now Gordonvale), and later at Meringa.

It was during this period that the Bureau's seedling raising and selection work was inaugurated at South Johnstone Station. Although the first entomologist, A.A. Girault was appointed in 1911, Easterby expanded that division by appointing A.P. Dodd and, successively, Edmund Jarvis, J.F. Illingworth, W. Cottrell-Dormer, G. Bates, R.W. Mungomery, J.H. Buzacott, A.N. Burns and W.A. McDougall.

Following Mr. Bell's appointment in 1928 in charge of the Pathology Division, Easterby expanded that division to include W. Cottrell-Dormer (transferred from entomology), E.J. Ferguson Wood, G. Wilson and N.L. Kelly. The industry-wide surveys which ensued laid the basis for disease control and quarantine measures.

Dr. H.W. Kerr

Subsequent to fulfilling the terms of the travelling scholarship-holders, Dr. Kerr was appointed Chief Chemist in 1928 and, on Easterby's death, was appointed Director. It was this move which introduced a new era in Bureau activity, and which inspired a new scientific approach to the industry's many problems.

Kerr was an experienced chemist who supplemented his basic knowledge of soil chemistry while studying under Emil Truog during his Ph.D. course at Madison, Wisconsin. On his return to Queensland he developed and implemented the soil-analytical procedures which are, with little amendment, still used to-day for assessment of available P and K and for total replaceable bases. He initiated the system of field fertility trials - qualitative and quantitative - which were used to define responses to N, P and K, and which formed the basis of the fertilizer advisory service.

But, of even greater benefit, Kerr introduced to sugar agriculture the system of properly designed replicated experiments, their statistical analysis and interpretation of results. At a time when the statistical method was understood by only a select few, the Bureau's activity in this field gave a lead to other primary industry research in Queensland. He began to build up the soils and agronomy division of the Bureau, and he applied these new principles, and his tremendous energy, not only to fertility investigations but to field variety trials. In those years, cane breeding and early selection was giving rise to many improved varieties, but the progressive testing and advanced selection was disorganized and wasteful. This was placed on a sounder basis, and the statistical method applied to final evaluation of newly produced varieties.

It was during his period of administration that the deficiencies of South Johnstone Station as a cross-pollination centre for seedling raising were recognized, and he arranged the transfer of the cane breeding activities to Meringa. Meringa then became the centre of both entomological and cane breeding research. More land was leased from the Crown and this now important station began to expand into a work-productive unit of the organization.

Simultaneously he recognized the shortcomings of The Lagoons property at Mackay. The then Palms Estate which belonged to Pleystowe Mill was being cut up and sold, and Dr. Kerr persuaded the Department of Agriculture to purchase the section which the existing Experiment Station occupies. Hindsight is always a handy tool, and it is frequently asserted that, at that time, he had the opportunity to select from Palms Estate a far superior piece of land. But Dr. Kerr deliberately chose a badly-drained, poor quality, clayey soil so that the Bureau could demonstrate the advantages of good agriculture under below-average conditions.

Hand-in-hand with the rapid expansion in experimental work in the fertility and varietal fields, Kerr attempted to increase the number of field officers and it was under his direction that Instructors in Cane Culture (now called Advisers) were selected and appointed. The Bureau, in those days - even more so than to-day - was short on funds and was controlled, insofar as appointments and salaries were concerned, by the Public Service Commissioner. Kerr was not able to appoint his planned requirement of field men, but managed to carry out a very sizable programme of work which was a compliment to his and their energy.

The relatively small Instructor (extension) staff in the 1930's was a barrier to spreading the research results throughout the cane-growing community. Kerr conceived the idea of the Canegrowers Quarterly Bulletin - the first of its type in any cane-producing country - and, with his customary energy, he launched it in 1933. It is now one of the Bureau's most important and valuable extension media.

Dr. Kerr continued as active Director until March, 1943 when, due to reduction of Bureau activities during the war, he was seconded to Commonwealth Government service. In 1945 he elected to remain in outside service and he resigned from the Bureau in that year, although still a young man. Kerr was a first class research worker with a brilliant and inquiring mind, and he had the facility to inspire his staff and to assist in planning their activities.

Dr. Kerr attained to presidency of the Q.S.S.C.T. in 1959. He was a voluminous writer and, together with Arthur Bell, wrote and published the Canegrowers Handbook. He later became the first Director of Research of the Sugar Research Institute.

Arthur F. Bell

Mr. Bell was the second of the travelling scholars, selected in 1924 for overseas training in plant pathology. As mentioned earlier, he took charge of the new Division of Plant Pathology on his return to Queensland. Prior to this, the Bureau had been for nearly three decades without any leader in this important field. Subsequent to his organizing this Division, further appointments were made of C.G. Hughes and D.R.L. Steindl.

In 1934 the Divisions of Entomology and Pathology were fused under Bell's control. In addition, he created a committee on seedling raising so that the Officers-in-Charge on each Station, together with the Cane Breeder, could discuss and report on, each year, the details of propagation and selection, and recommend changes in technique and procedure. Bell became Assistant Director in December, 1935, Acting Director in 1943, and Director in 1945. His term in the Chair was of brief duration, since he was appointed Under Secretary, Department of Agriculture and Stock in 1947.

Mr. Bell served a term 1942-46 as President of the Q.S.S.C.T., and was General Secretary-Treasurer of the 1935 I.S.S.C.T. Congress in Queensland. Earlier he was a Queensland delegate to the I.S.S.C.T. Congress in Puerto Rico in 1932.

Kerr and Bell administered the Bureau from 1933 to 1945 when the former was seconded for Commonwealth duty; the latter continued as administrator until 1947. During their dual term, many far reaching developments were initiated. But one of Bell's more important contributions was the Amending Act of 1938 when large, new sections were incorporated in the Sugar Experiment Stations Act to improve the legislation covering disease and pest control. These legislative measures, unique in the sugar world, are the envy of sugar experiment stations in other countries, where no such measures exist.

In this period began the system of disease resistance trials. Queensland, because of its uncontrolled importation of cane varieties from all over the world since the start of the industry, and because of the absence of adequate quarantines - or trained personnel to recognize diseases - had become the repository for most of the sugar world's major diseases. There were few exceptions; the industry was fortunate to escape sereh, smut and

streak. The result was as fine a collection of sugar-cane maladies as could be found in any single country. There was uncontrolled distribution of new, imported varieties between all areas of the State. There were no quarantine boundaries, and there was no recognition of disease symptoms, with one notable exception. Henry Tryon was, before and after the turn of the century, entomologist and vegetable pathologist in the Department of Agriculture and he was, on occasion, assigned to investigate growth problems in the sugar industry.

It is on record that he detected a wide-spread infestation of gumming disease in 1894 in the Wide Bay and Burnett districts. Red rot was also known to be causing losses in the Mackay and further-north areas. There is mention of gumming disease in the Herbert River in 1902 and, in the same area, a disease which was probably downy mildew.

This past history, and the growing recognition of a serious disease situation, injected a note of urgency into the testing - before release for commercial planting - of all promising, imported and locally bred varieties. And this led to the inauguration of properly designed plantings of varieties, of both known and unknown disease reactions, so that their degree of resistance or susceptibility could be assessed. Separate trials, encompassing different diseases, with inoculation procedures or, as in the case of Fiji disease, with interspersing of diseased stools, became standard lines of investigation. In this way the too-susceptible varieties were weeded out.

The techniques of such resistance trials have been refined, adjusted and altered over the years in accordance with experience and with advancing knowledge; adaptation of procedures has kept pace with modes of interpretation. But the basic concept still remains - the testing of susceptibility or resistance to any disease which could conceivably create a threat to production.

Bell established Queensland's first sugar-cane quarantine house. It was a modest structure in the grounds of the Department of Agriculture and Stock in Brisbane. Perhaps its location was its best feature - it occupied a prestige site on the Brisbane river waterfront. And in recent years - long after the Bureau vacated it - it has succumbed to progress; to-day, the riverside expressway runs directly over the site. But the quarantine

house served its planned purpose. All imported canes were germinated, grew to maturity, and were carefully examined pathologically before transmission to commercial cane-growing areas.

Another of the many moves which Bell initiated - and one which is unique in the world sugar industries - was the creation of Cane Pest and Disease Control Boards. The original concept pre-dated Bell's regime, but he built on it, improved it, drafted legislation and finally devised the chain of Boards which to-day links all of the sugar areas in Queensland.

After Arthur Bell's accession to the under secretarial chair, and his divorcement from active participation in Bureau affairs, he still remained a valued adviser to some of his successors in office. And one of his unwritten achievements was the part he played in the divorcement of the Bureau from Public Service control.

It is well known that, for many years - reaching back to the 1920's -, the sugar organizations had sought to persuade the Government to hand over the Bureau to the industry. Many joint approaches were made, with no effective result. Even the establishment of the Advisory Board in 1955 was an unsatisfactory palliative, and it did nothing to appease the industry. But finally, in 1949, the then General Secretary of the Queensland Cane Growers' Council, Mr. R.J. Muir, decided, in consultation with the Director, that he would make a final appeal to the Government. This request, addressed to the Premier, was referred to the Minister for Agriculture and Stock, the Hon. H.H. Collins and, on the advice of the Under Secretary - Arthur Bell - the recommendation went to Cabinet and was approved.

This led to the 1951 Amendment Act which had far-reaching effects. If it had not been for that amendment the Bureau staff would still be public servants (and that, in itself, is no disability); they would be tied to public service salaries and conditions; the Bureau's expansion programme, both in property and staff, would not have reached its present high level; and - and this is of premier importance - the sugar industry would never have accorded the Bureau the same degree of esteem which it now gives. This may be illogical but, none the less, true. There is pride in ownership, and the industry now feels that it has its own Bureau.

But, one tends to deviate from the subject. The point at issue is that Arthur Bell played a highly important part in this major change. Later in these notes a return will be made to the new structure - the Sugar Experiment Stations Board - in the creation of which he was both prime mover (legislatively) and architect (administratively). Arthur Bell died in his office from a heart attack on May 14th, 1958. The Bureau lost a good friend and advocate.

Edmond R. (Rolly) Behne

Mr. Behne was the first member of the staff who began his working life in the Bureau and advanced to the position of Director. He succeeded Mr. Bell when the latter became Under Secretary. For the first time a non-agricultural man became the Bureau's administrative head. He was appointed in January, 1930, following graduation in applied science, to the staff of the Bureau's Mill Technology Division, then located at the Mackay Sugar Experiment Station at The Lagoons.

Just prior to that time (1928), the Division had been created, under the leadership of Mr. Norman Bennett, the third of the travelling scholars referred to previously. But Bennett's service in the Bureau was short-lived and culminated in his retirement in January, 1932 to become Manager of Racecourse Mill.

The Division, with Mr. Behne as the sole member, was transferred to Brisbane. The growth and work of that Division is discussed in a later note. Suffice to state at this juncture that Mr. Behne progressed through the steps of being Chief Mill Technologist, Assistant Director and Director. He made a deep and lasting impression on sugar mill technology in this State. But, as a mill technologist, he was not happy in the Director's chair. He found that over 90 per cent of his day-by-day duties were connected with the agricultural side of the industry, and this undoubtedly influenced him in his decision to accept a mill managerial position with Pioneer Sugar Mills and to resign from Bureau service. He had been Director for only nine months, from May, 1947 to February, 1948.

The brief period, when Mr. Behne was Assistant Director and then Director, was not a formative one in Bureau history. The industry, and the Bureau, were climbing back to normality after the recessions and restrictions

imposed by the war years. It was a time when staff recruitment was urgent, and when Station and farm experimental work was undergoing re-organization. Sugar production, which had reached nearly 900,000 tons in 1939, and then receded seriously to less than 500,000, did not pass the 1939 figure until 1948.

Behne eventually became Managing Director of Pioneer Sugar Mills and continues as such at time of writing these notes.

Norman J. King

Mr. King succeeded Behne as Director in May, 1948. He had joined the Bureau, by secondment from the Agricultural Chemical Laboratory, in October, 1932; but had had prior experience in sugar from 1925 to 1927 in the Bureau of Central Sugar Mills, and in 1930 when loaned to the Bureau for soil survey work. After fifteen years in Bundaberg (ten of them in charge of the Experiment Station), he was appointed Assistant Director in 1947 and Director in the following year.

During his period as Director he was President of the Q.S.S.C.T. in 1953, General Secretary-Treasurer of the I.S.S.C.T. 1950 Congress, General Vice-Chairman of the I.S.S.C.T. 1956 Congress, and was elected an Honorary Life Member of the International Society in 1971. He was appointed a Royal Commissioner into the Queensland sugar industry in 1950, and was a member of the Gibbs Committee of Inquiry in 1963.

King was the senior author of the Manual of Cane Growing, the first and revised editions of which were published in 1953 and 1963.

Decade by Decade

The First. 1901 to 1910

Since this decade was covered largely under the leadership of Dr. Maxwell, the Bureau's activities were, to a great extent, a reflection of his particular interests. As a student of the soil, and with a belief that crop growth and health were mainly related to soil conditions, he concentrated his staff's efforts on soils, manuring and cultivation methods.

Although there was an Experiment Station at Mackay (The Lagoons), and a soils laboratory cum administrative centre at Bundaberg, a reader of reports to-day could be excused for thinking that the Station was a subsidiary of the laboratory, and not the reverse.

In the laboratory, Maxwell built up a staff of assistant chemists - Firman Thompson, Dr. Arthur Gibson, George Patten, Claude O'Brien and A.E. Anderssen. Some of these men toured the sugar areas each year, collected hundreds of soil samples and performed detailed and exhaustive analyses. The first Annual Report records that 573 samples were taken and, by 1909, Maxwell's last year, it was reported that, during 1908-09 13,000 analyses were carried out on soils, waters, manures, etc.

Maxwell paid a lot of attention to differentiation of soil types, and in attempting to define cultivation methods and fertilizing for each type. Sub-stations on farmers' properties were used for many of the experiments, and he was able to show an average increase in cane yield from 14.7 tons to 23.9 tons per acre due to "intensive cultivation" methods on these farms. At that time, the State average yield was 13.2 tons per acre, so the Bureau's experiments, ranging from Mossman to Beenleigh showed very respectable gains.

The experimental work was largely concerned with subsoiling, deep ploughing, fertilizing and liming. Even in such early years, some irrigation was introduced into the trials in some areas. And, from the start of operations, there was some emphasis on green manuring, including soya beans, lupins, cowpeas, tares, velvet beans, rape and Black Mauritius bean.

On the Mackay Experiment Station some trials along similar lines were carried out - depth of ploughing, subsoiling and fertilizing. But, from the Annual Reports of the time, it would appear that priority was given to the sorting out and testing of a wide range of cane varieties. The Tryon collection of 1896 was prominent in this testing. But since all of this

work predated the statistical method of agricultural experimentation, the trials consisted of the conventional single plots, without replication.

It is interesting to note, in variety observation plots, even in those early years, the number of sub-district observations which were made. In the sorting out of some N.G. canes, duplicate plantings were made (for the Bundaberg area) at Gooburrum, Qunaba, Spring Hill, Bingera, Invicta and Gin Gin. Simultaneously, other plantings were observed at Isis, Nikenbah, Takura, Bauple, Nambour, Beenleigh and Nerang.

In a very brief summary, this first decade of Bureau work had a high degree of emphasis on soils, their exhaustive analysis, experimentation with plant foods, and the preaching of the gospel of fertilization. In the ten years much work was done on cultural methods, on green manuring and on testing of a wide range of new varieties.

Considering the small staff, the limited land, the difficulties of travel and the limits imposed by the methods and materials then available, very great progress was made.

#### The Second. 1911 to 1920

The second decade produced some important changes. In August, 1910 the Assistant Director, Mr. H.T. Easterby, resigned to go to Victoria where he was associated with the beet sugar industry. Since the title of Director was held nominally by the then Under Secretary for Agriculture, Mr. E.G. Scriven, the Bureau was without an active leader. A re-organization of the Bureau was made, and Dr. A.J. Gibson was appointed General Superintendent in late 1910 and L.C. McCreedy, previously an Assistant Chemist, was appointed Chemist in Charge of the Mackay Station.

The Bundaberg laboratory was closed down, and the conduct of most of the chemical analytical work was transferred to the Agricultural Chemical Laboratory in Brisbane.

The new leadership did not last too long. In May, 1912 Dr. Gibson resigned upon his transfer to the Treasury Department to become General Manager of Central Sugar Mills. Records do not disclose the details of the next move, but Mr. Easterby returned from Victoria and became General Superintendent in August, 1912.

Part of Dr. Gibson's report for 1911 records, inter alia :-  
"plots were established in the following localities, viz. - Mossman, Cairns,

Johnstone River, Herbert River, Burdekin, Proserpine, Bundaberg, Isis and Maryborough districts. Two Agricultural Instructors, Messrs. H.T. Harvey and H. Burn, were appointed for the purpose of supervising the work of the farmers in the methods of cultivating, planting, etc. One of the Instructors ..... travels over the sugar areas from Rockhampton southwards. The other Inspector deals with the districts from Proserpine northwards." This was a revival of the farmers' sub-station system originally introduced by Dr. Maxwell.

There was a big change in the soil analysis emphasis. By 1914-15 the number of soils analysed had fallen to 21 at Mackay and 46 in Brisbane and, by 1919-20 the soils analysed were 22 at Mackay, 5 at South Johnstone and 60 in Brisbane.

But perhaps the major development in Bureau growth during the second decade was the acquisition of two more Experiment Stations. In Dr. Maxwell's original report to the Government in 1900 he visualised a chain of three Stations - Mulgrave, Mackay and Bundaberg. During his  $8\frac{1}{2}$  years of office he did not achieve his aim. In fact, the Mackay Station at The Lagoons was already there and Dr. Maxwell supplemented it by having constructed the soils laboratory and administrative office in Bundaberg. But no further properties were acquired.

Mr. Easterby firstly arranged the purchase of a cane farm in the Woongarra area of Bundaberg to serve as an Experiment Station. This was in 1913. The property was purchased as a going concern, and comprised the 45 acres which served as the Bureau's southern centre until quite recently when it was added to by the purchase of the adjoining farm.

In 1917 it was decided to complete the original plan of three experiment stations by establishing the third unit in the tropical north. A site at South Johnstone, at the foot of the Basilisk was chosen, and consisted of average quality land of a type claimed to be common to many north Queensland districts. Although acquired primarily for agricultural experimentation in the wet north, the Bureau very soon interested itself in seedling raising since the production of fertile seed raised no problems in that environment. The then Chemist in Charge, P. McWalters, planted out over 700 seedlings in 1921. During the first few years, during which the number rose to several thousand annually, the seedlings obtained were from natural field pollination, but in the decade under review the seedling raising programme had not yet got under way.

Another move with far-reaching consequences was the appointment of the Bureau's first entomologist. Here again, I quote Dr. Gibson in 1911 - "An entomologist, Mr. A.A. Girault, has been appointed, and his services are available to deal with entomological problems in relation to the sugar industry in Queensland. At the time of his arrival, the grub pest was causing grave concern to sugar growers, and it was deemed advisable that Mr. Girault take up his headquarters at Cairns. He is now established at Nelson\*, where, with an assistant, he is engaged in pursuing investigations in connection with the grub pest."

At the request of the Queensland Government, Girault had been selected by the U.S. Secretary for Agriculture to fill this position. He was later joined by A.P. Dodd. Girault returned to America in 1914, but Dodd remained with the Bureau until 1921. While we are still involved in the entomological field, in this second decade, it should be recorded that, on Girault's resignation, the gap was filled temporarily by Edmund Jarvis until the appointment, in 1917, of Dr. J.F. Illingworth, previously Professor of Entomology at the University of Hawaii.

Just prior to Illingworth's appointment - in 1916 to be precise - Easterby persuaded the Government to establish an entomological station so that field experiments could be conducted by the entomologists. The small building at Nelson - essentially a makeshift laboratory, had no such facilities. Accordingly, the Government allocated a small area of Crown land at Meringa; it was part of an area delineated on the map as a Prison Reserve. Buildings were erected to accommodate the entomologists, and for a working laboratory; and a few acres of land were made available for entomological experiments. This was the beginning of what is now Meringa Sugar Experiment Station. The existing manager's residence at Meringa was originally occupied by the Entomologist. Another residence allocated to the Assistant Entomologist, was later converted to a laboratory, and subsequently removed to make way for the present two-storied office building. And the original entomological laboratory still remains.

At this juncture, it is appropriate to point to the fact that, in the first two decades of this century the Bureau, with a very small staff,

---

\* Nelson was the original name of Gordonvale. The P.M.G. Department, in its wisdom, changed the name because there was a Nelson in Victoria.

had attracted three men with doctorates to work on sugar problems - Maxwell, Gibson and Illingworth. This must surely have constituted a record for a primary industry research body in those days.

The decade witnessed an upsurge in agricultural experimentation. A.P. Gibson (another member of the Bingera Gibson family) was appointed Field Assistant in 1915; H.T. Harvey assumed a similar position in 1912; and Mr. J.C. Murray joined the Field Assistant group in 1918. As at 1915 the General Superintendent, in his Annual Report stated "In order that a complete survey of Queensland cane farms may be on record, the Field Assistants were instructed to make observations upon each farm visited by them, which are tabulated and sent in to the Sugar Bureau every month. These comprise notes on soils and their testing for alkalinity and acidity, crops, use of lime, green manures and fertilizers, drainage, irrigation, weather, ploughing, planting, cultivation, harvesting, ratooning, labour, pests, varieties of cane, arrowing of cane, disposal of trash, etc.

"In pursuance of these instructions, the Field Officers have sent in reports upon 654 farms, Upon these 69 farmers have used lime, 168 have practised green manuring, and 235 have used fertilizers."

During this period, we find in reports reference to experiments under such headings as :-

- Ratooning experiment with four different methods.
- Comparison of planting with arrowed and non-arrowed plants.
- Comparison of different methods of after-tillage.
- Spraying experiments for destruction of weeds.
- Tests with different varieties of cane.
- Trials with new canes from Louisiana, the Wells collection and Queensland Acclimitization Society seedling canes.
- Liming, cultivation and manuring with D.1135.
- Experiments with Badila at 5', 6' and 7' interspacing.
- Hand planting versus machine planting.
- Comparison of ordinary cultivation of plant crops v. no cultivation.

In the entomological field, experiments listed included :-

- Investigation of poison baits for destroying grubs.
- Investigating parasites attacking the larval and egg stages.

Light trapping as a means of beetle control.

Experimentation with bagasse and other organic waste to reduce larval feeding on cane roots.

Destruction of feeding trees.

Use of muscardine fungus and parasitic wasps.

The decade also witnessed what may have been the start of extension through the printed medium. Easterby prepared and distributed Bulletins in the General Series, and also a leaflet to stimulate Queensland's sugar production, which was sent to every grower. At the same time, Illingworth issued his "Australian Sugar Cane Beetles and their Allies" - still one of the finest treatises on the subject.

There is no doubt that this was a decade of Bureau progress. Sugar production in Queensland had not increased significantly in this period, but the reason was mainly economic. Up to the end of this decade Australia was not producing home requirements and the price was not favourable. This situation did not encourage expansion. But the Bureau's work did grow, and there was an increasing awareness of the contribution being made to improvement of production per unit area. Perhaps this growing interest in Bureau activities was responsible for the inauguration, during this period of the Experiment Station Annual Field Day function. Or, maybe, it was Harry Easterby's appreciation of the potential benefits of education by demonstration which led him to initiate this movement.

#### The Third. 1921 to 1930

Perhaps this period may best be referred to as the one when the Bureau emerged as a scientific research organization. This statement does not, and is not intended to, depreciate the abilities and application of such men as Maxwell, Girault or Illingworth. But the decade we are about to survey contained so many new elements, the appointment of so many new specialists and a completely new approach to the scientific method, that it must be acknowledged as an era of important change in Bureau activities.

Easterby, previously General Superintendent, was appointed Director in 1921. And history should record that it was not in the best interests of the Bureau that, for a period of some twelve years, the title of Director

was retained by the departmental Under Secretary - from the time when Maxwell, the first Director, resigned. Perhaps Easterby, during his period as General Superintendent, possessed the same degree of authority and autonomy as if he had been called "Director"; we cannot assess that to-day. It has to be remembered that, while the Bureau was associated closely with the Department of Agriculture from 1909 to 1951, the Director was always under a similar degree of Under Secretarial control and supervision as were the heads of other branches of the department - even though the sugar industry supplied half the finance up to 1934, and a progressively larger proportion from 1934 to 1951 - when the divorcement from public service control took place.

The writer well remembers a later Director, Dr. H.W. Kerr, saying "I could not wish for a more interesting and rewarding position than that of Director of the Bureau - without Government control."

There had, from time to time, been rumblings in the industry regarding the close association of the Bureau with the Public Service, and many approaches were made to the Government to accede to industry wishes to own and operate its own Bureau. This is mentioned at this stage only to introduce the matter. There will be much more later.

Brief reference was made earlier to the beginnings of seedling raising at South Johnstone in 1921. These seedlings, resulting from natural pollination, gave rise to some varieties of value. The female parent was usually Badila, and the first batch included S.J.2, S.J.4 and S.J.16. All became commercial canes of some importance. In the mid-twenties Mr. W. Cottrell-Dormer investigated the fertility of cane flowers, and his studies led to the adoption of a system of controlled pollination with use of a dilute sulphurous acid solution for the maintenance of male arrows.

When McWalters retired in 1927 and was replaced by Mr. E.J. Barke as Chemist in Charge; the latter continued, not only as Station manager, but as cane breeder for a considerable period. Records indicate that 15,000 seedlings were raised at South Johnstone in 1927.

As mentioned earlier, under the heading of H.F. Easterby, the progressive move was made to train, specially, three travelling scholars

with the aim of their ultimately assuming responsibility for three divisions within the Bureau. Following is an extract from the 1924 Annual Report :-

"Arrangements have been made by the Department of Agriculture to send abroad three graduates of the University of Queensland, who already possess a knowledge of the sugar industry, to study different branches of the industry, and to receive special training in university centres and colleges in Great Britain, America and Hawaii, as well as to visit other sugar districts of the world ....."

These three graduates, Mr. H.W. Kerr, M.Sc. had majored in chemistry, Mr. A.F. Bell, B.Sc. had majored in plant pathology, and Mr. N. Bennett, B.Sc.App. was selected for further study in sugar mill technology.

During the absence of these three gentlemen - from 1924 to 1928 - other events, worthy of mention, occurred within the Bureau, either during that period or within the decade. Records show an upsurge in recruitment of entomologists and pathologists, mostly of graduate standard. In 1922 W. Cottrell-Dormer joined the division of entomology, but was switched over to disease investigations two years later. In 1923 G. Bates, a Hawkesbury diplomate, joined the same division but left it for Soils and Agriculture in 1930. In 1925 A.N. Burns and R.W. Mungomery (surprisingly, a School of Mines diplomate, but with later entomological experience with the Prickly Pear Board) were appointed to the entomology division; and, in the same year E.J. Ferguson-Wood and N.L. Kelly were appointed as junior pathologists. In the following year, 1926, J.H. Buzacott joined the entomologists, and G. Wilson became one of the pathology group. It is perhaps not generally known that George Wilson was, initially, engaged as a pathologist. He served in that capacity for three years, left the Bureau to become a Pest Board supervisor, and rejoined the staff in 1947 as an entomologist. In 1928 W.A. McDougall joined the entomology division.

Within the same period, there was a further appointment of a field officer, E.H. Osborn. But this group was not really growing. Of those mentioned previously, several had left and the best the Bureau could claim in those days was that it was managing to replace the losses. Even by the late 1920's, there were only three field staff - A.P. Gibson, E.H. Osborn and J.C. Murray.

The appointments mentioned above gave a tremendous fillip to investigations into insect pest problems, and allowed the first survey and appreciation of the disease situation in the industry.

This third decade did not witness the solution of the greyback grub problem, but a significant advance took place. For some years after entomological work began at Nelson, and then at Meringa, the cane growing community had become somewhat disenchanted. Perhaps they had expected miracles in the fight against greyback grubs, and the miracles were not occurring. And naturally they were not impressed by the vast amount of research into life histories, feeding habits, movement in soils, etc. Grub poisons had not worked, parasitism had not improved, cultural procedures for egg control were not effective and there was a general impression that the entomology station was not economically justified. Around the Cairns area Meringa was referred to slightly and scornfully as the "grub farm".

In 1923 there was a breakthrough with the use on Meringa of paradichlorobenzene, applied with the Jarvis injector, designed for injecting dry crystals. Much earlier in the century injection of carbon bisulphide had been tried with erratic results. But, following the Meringa work with paradichlor, Hunter Freeman of the C.S.R. Company experimented with paradichlor dissolved in carbon bisulphide, with considerable success. This work was done on Green Hill plantation. Soil injection with this mixture became a commercial practice but, despite its success in saving the crops on grub-prone farms, the cost and the arduous work involved militated against widespread acceptance. At no time did the treated area exceed 2,000 acres.

In 1924 Cottrell-Dormer carried out the first comprehensive survey of cane diseases, and similar surveys were conducted in the two succeeding years. These surveys, and the discoveries made, formed the foundation on which much of the later disease control work was constructed.

In 1926 another of the new pathologists, N.L. Kelly, made the first findings of Fiji disease in Queensland; it was in cane at Maryborough and Beenleigh.

In 1927 E.J. Ferguson-Wood made some suggestions which led to legislative changes aimed at disease control. It was he who recommended division of the sugar belt into quarantine districts, and that only proven varieties should be allowed to be grown. The latter was the basis of the "Approved Variety" system.

"Approved varieties" are taken for granted to-day. But, in earlier years, the variety situation was rather chaotic. There were no controls; any grower could plant whatever he wished; and there grew up in Queensland a race of "variety kings". It was not uncommon in the 1930's to come upon these proud collectors who propagated, in a special block, a couple of hundred varieties - often severely diseased.

The first step in limitation of varietal planting came in 1934, and it was achieved by an amendment to the Regulation of Sugar Cane Prices Act. The Director then issued a list to all Local Cane Prices Boards; the individual Boards designated any or all varieties on the lists to be approved varieties. The individual Local Cane Prices Boards could not approve any variety which was not on the Director's list. This was the situation until the Bureau's 1938 Amending Act under which the Director issued annually an "Approved Variety List". The matter was taken out of the hands of Cane Prices Boards, and the decisions regarding cane varieties to be grown became solely the prerogative of the Bureau.

On the agricultural front, this decade was one of steady progress, but without any major change in outlook until the last two years. The field assistants continued to report on individual farms, and the 1928 Annual Report recorded that, since beginning the system, 5,825 farms had been reported on. At that time, only 25 per cent of growers were using fertilizers. There was a pronounced growth in fertility trials and an even greater increase in new variety testing. Many new canes were imported and some of these, the P.O.J.'s and the Co.'s, later became commercialized in Queensland.

Java, at that time, was the unchallenged scientific centre of the cane-sugar world. It was away ahead of anyone else in planned cane breeding. The late-numbered P.O.J. canes contained the genes which re-vitalised, not only Java, but many other countries. Queensland

benefitted mostly through P.O.J.2878 which regenerated the industry in south Queensland. In the late 1930's Java's sugar production soared to a peak of three million tons; compare this with Queensland's present production of 2.5 million and Java's present output of about 700,000 tons. Our industry, in the late 1920's was experimenting with P.O.J.2878, P.O.J.2725, P.O.J.2875, P.O.J.2883 and P.O.J.2940. We also interested ourselves in some earlier ones - P.O.J.234, P.O.J.979 and P.O.J.2714. Much of this interest was associated with the fact that many of the P.O.J. varieties were highly resistant to gumming disease, at that time the scourge of the south Queensland industry.

In 1928 a reformation took place with the return to Queensland of the three travelling scholars referred to previously. Before recording the changes which developed at the end of this decade, it is appropriate to quote from the foreword to "Fifty Years of Scientific Progress" - a Bureau publication which recorded the achievements of the Bureau's first fifty years. That foreword was written by Arthur F. Bell. He said :- "The activities of the Bureau fall naturally into two distinct periods of about twenty-five years each. Beginning in what now must be regarded as the early morning mists of scientific agriculture, the first period was predominantly one of exploratory observation and recording, the assessment of problems, and the development of facilities. The second period was characterised by the recruitment of highly trained staff, the initiation of researches inspired by the knowledge previously gained, and the organization of comprehensive extension services."

In the final part of his foreword, he quoted Sir William Whetham :

"But beyond the bright searchlight of science,  
Out of sight of the windows of sense,  
Old riddles still bid us defiance,  
Old questions of why and of whence."

If Arthur Bell had written that foreword twenty years later, could he have described Bureau progress more succinctly?

The work of the three divisions - soils and agriculture, plant pathology and mill technology - got away to a quick start. In the first-mentioned division, there was rapid evidence of the change in approach

to agricultural experimentation. The 1930 Annual Report details the various randomised block and Latin Square trials planted on Experiment Stations; and Bulletin No. 1 in the Farm Series records that, in the first series of farm fertility trials, 29 experiments were carried through successfully.

In the field of pathology, the separation of the sugar belt into major quarantine districts became a fait accompli in 1929 and, in the following year, the Annual Report began to show results of disease resistance trials.

The mill technology division also got busily to work. Norman Bennett was responsible for a meeting being convened in Mackay at which the decision was made to constitute the Q.S.S.C.T. Although viewed with suspicion in some quarters, it soon became firmly established and grew to be an important part of industry technology.

In the same year Bennett inaugurated the Mutual Control Scheme, which continues to operate in 27 mills, and which is of great value in the weekly interchange of factory operating data. The Bureau still operates the scheme, together with the publication of the Plant Data Record. We are not aware that any other sugar producing country has devised, or maintains, a service of similar quality.

Another item of interest in the closing year of that decade was that the Bureau made its first attempt to conduct a reconnaissance soil survey of cane growing lands. N.J. King was borrowed from the Agricultural Chemical Laboratory for the purpose, and the soils of many districts were mapped in broad types. The underlying purpose was a dovetailing of this data with the fertility trial information so as to assist in predictions of fertilizer requirement. This soil survey concept has not been continued to finalization. Some extra work was done by King in 1936-37, but there is probably a sound, basic reason for completing this work in the future.

The only change in field officer strength in the late 1920's was the transfer of G. Bates from entomology to field-agronomy duty.

#### The Fourth. 1931 to 1940

This decade was an era of noticeable development and change within the Bureau, and one in which the Bureau's contribution to the industry made an appreciable impact. Between 1930 and 1940 the staff

establishment had grown from 23 to 50, the largest increase being in the field; new appointments included Knust, Christie, Story, Skinner, Smith, Elliott, Humphry, Abbott and Pembroke. But some of the older field officers - Gibson, Osborn and Murray - had resigned.

The Mill Technology Division had lost its leader, Mr. N. Bennett, but it gained Jenkins, Praeger and Clayton. As a leader, Ir. J. Eigenhuis was brought in from Java for three years during the period, but returned there in 1938.

In pathology Hughes and Steindl were two new appointees, but the decade witnessed the loss of Cottrell-Dorner, Ferguson Wood and Kelly.

It is difficult to select the most important events in this period. But, apart from direct technology, the decade was one during which the publication of Bureau work - extension material and technical communications - was developed. The Quarterly Bulletin commenced in July, 1935, and the Technical Communications in 1937. The bulletins in the Farm Series began to appear in 1931, the mill technology News Letters in 1940, and the Mutual Control Synopsis in 1932.

One cannot but be surprised, at this late date, at the number of farm trials planted and harvested in that period by a relatively small number of advisory staff with primitive equipment, no labour and difficult travelling conditions. Records show :-

<u>Year</u>	<u>Fertility trials harvested</u>	<u>Variety trials harvested</u>
1935	38	6
1937	32	12
1939	31	37

The initial system of qualitative fertility trials progressed to quantitative ones, following the definition of which nutrients were the limiting factors in growth. As techniques improved factorial layouts tended to replace Latin Squares; and simultaneous with the large number of fertility experiments the criteria were developed to form the basis of the soil analysis and fertilizer advisory service.

We find, in the late 1930's that entomological investigations had not led to any real break-through in insect pest control. The carbon bisulphide-paradichlor mixture was still the best control measure but

was used only on small acreages. Improved drainage and time of planting were the recommended approaches to avoidance of wireworm damage. McDougall, in Mackay, concentrated largely on a study of rats, their life history and habits.

The Annual Conferences of Pest Boards began in 1935. The first meeting was called by the S.E.S. Advisory Board and was held in Townsville. It was restricted to Pest Boards north of Townsville, and was primarily designed to discuss far-northern pest problems. This Bureau-sponsored move has led to the present-day conferences of Cane Pest and Disease Control Boards covering all districts from Mossman to Rocky Point, and including both pest and disease matters.

It is not generally appreciated that, without the Bureau contribution in planning, organizing, preparing papers and reports and editing and publishing the proceedings, there would be no conferences. In the years when such meetings were held separately, and when the conferences depended upon contributed papers, only a very small percentage came from the supervisors; the Bureau staff had to produce pot-boilers to fill in the conference time. And, in recent years, after amalgamation with the Q.S.S.C.T., the only material prepared for presentation is the entomology and pathology review and the Summary of Data - all from the Bureau. The time may come when, purely through lack of tangible support by the Boards, the conferences may collapse through redundancy.

In 1935, as one of the projects designed to reduce the depredations of the greyback grub, Mungomery went to Hawaii and arranged the importation of the Giant American Toad - *Bufo marinus*. The offspring were subsequently liberated in all major sugar areas, where they multiplied successfully and, in some cases, prolifically. There have been many criticisms of the toad, mainly from non-cane localities. They were not a success in reducing beetle populations in sugar districts but it is interesting to note that, even in the year of introduction, our Annual Report said "The importation of this toad has been made primarily in the hope that it will aid in controlling the greyback beetle . . . . Nevertheless, should it fall short of our hopes in this respect, there is little doubt that the importation will be more than justified by the attack upon other pests."

A good deal of work was initiated on destruction of beetle feeding trees in localities close to cane areas, and on the use of attractants on feeding trees. But neither led to significant reduction of infestation in cane fields, although some claims were made that, following wide-scale tree destruction, certain adjacent farms suffered less damage.

Advances in pathology work were considerable. This related not only to researches, but to recognition and definition of infected areas and to implementation of control measures. Mungomery's studies in Bundaberg led to the identification of the insect vector of Fiji disease - *Perkinsiella saccharicida* - and to the collation of much data on life history and breeding habits of the insect. This was a worthy piece of research in its own right, but it also became the basis of disease resistance testing with this disease.

In 1935 we find records that El Arish was the worst leaf-scald area in the industry; that gumming disease would soon cease to be a factor of importance in the southern districts; that gumming existed in Mossman on nine farms; and that downy mildew was mainly confined to the Lower Burdekin, with a scattering throughout the Mackay area. A few years later, 1939, rather contrasting comments were made :- Bundaberg was virtually free of gumming, but a new outbreak had occurred in Hambleton; Fiji disease had reached serious proportions in Bundaberg; and downy mildew was considered to constitute the chief disease problem in the industry, including outbreaks in Mossman, Hambleton, Mulgrave, Ingham, Lower Burdekin and Mackay, and a serious infestation in Bundaberg.

Downy mildew transmission studies were undertaken between cane, maize, sorghum and a range of grasses, and a considerable amount of study of the histology of the disease in cane and corn was undertaken.

The first of the Disease Control Boards came into being in this period - as distinct from the older-established Pest Control Boards. And these were instituted to exercise better control over diseases and, by inspection and roguing, to reduce disease incidence.

The Bureau's resistance trials gave a lead to replacement varieties with reduced susceptibility, and the powers under the Sugar Experiment Stations Act, particularly the 1938 Amendment Act, provided for plough-out and harvest orders being issued in bad cases.

The cane sugar world envies the powers which the Bureau possesses (a) to proclaim interdistrict quarantine boundaries, (b) to control through the approved variety list the varieties which may be grown, and (c) to order destruction of diseased fields. These powers come to the Bureau through the Sugar Experiment Stations Act, and because of the early connection of the Bureau with the State Government. Most other sugar industries do not have the privilege of this close contact with government and, as a result, do not possess legislative powers. It is almost indisputable that, without such powers in the hands of the Bureau, our industry's disease situation could have been calamitous.

The Mill Technology Division, starting from scratch in 1928, rapidly assumed a position of importance. Although its originator, Norman Bennett, resigned in 1932, and there was some hiatus before mill investigations really got going, the decade was a very fruitful one. Eigenhuis was engaged from Java in 1935 for a three-year term and he built up a team including Behne, McBryde, Smith, Jenkins, Praeger and Clayton. It was a period of intense activity, and investigations were conducted into practically every section of mill operations. A formidable flow of Technical Communications emanated from the Division.

The first edition of the Laboratory Manual for Queensland Sugar Mills appeared in 1934 and the second edition in 1939; both were prepared by the division.

About the middle of this decade there was set up, within the Bureau, a Committee on Seedling Raising. This consisted of the Assistant Director, the Pathologist, and the officers in charge of the three Experiment Stations; its purpose, at annual meetings, was to co-ordinate and to standardise methods for raising, planting, fertilizing and selection of cane seedlings. This led ultimately to the 10-sett and 40-sett systems of early trials and to the refractometer brix method of assessing sugar content. It can be noted also that experimental work on fuzze storage down to 32°F temperature was initiated at that time.

It was also during this period that the cane breeding centre for north Queensland was transferred from South Johnstone to Meringa, this move taking place in 1934. However Barke, the then cane breeder, was transferred

in 1938 to the field staff, and Hughes was, for a period, annually seconded to Meringa for the cross-pollination season.

Each of the three Stations at Meringa, Mackay and Bundaberg was equipped, between 1936 and 1938 with heated glasshouses for seedling raising, and with seedling benches and ancillary equipment. This was the beginning of large-scale, controlled seedling raising, although it had been preceded by considerable work with more primitive facilities.

Within this ten-year period, the managership of the three Experiment Stations underwent change. In 1935, with the move from the old Mackay Station at The Lagoons to the new one at Te Kowai, Keogh the previous Chemist in Charge was transferred to the Agricultural Chemical Laboratory in Brisbane, and replaced by McBryde.

In 1937 King was appointed Chemist in Charge at the Bundaberg Experiment Station in place of Pringle who was also transferred to the Chemical Laboratory. And in the following year, when Barke left Meringa for Ayr, Mungomery became Officer in Charge at that centre.

During the 1930's the Q.S.S.C.T. - soon after its formation in 1929 - began to use some of its accumulated funds to send delegates to the I.S.S.C.T. Congresses. In 1932 the Society selected Mr. G.S. Moore, Manager of Millaquin Mill, to represent it at Puerto Rico. He was accompanied by Arthur Bell who was the Queensland Government delegate.

In 1938 the Society selected Reg. Blomfield of Fairymead (Engineering), Miles Doolan of Mulgrave (Chemical) and Norman King of Bundaberg Sugar Experiment Station (Agriculture). The Society allocated £1,000 for its delegation, so each member received £333 to attend the Louisiana Congress, including all travel and accommodation costs. They were absent from Australia for over three months. The Bureau did not subsidize the trip.

#### The Fifth. 1941 to 1950

Towards the end of the previous decade World War II broke out, and this was to have a serious impact on Bureau operations. Enlistments in the fighting forces began in 1940 and, late in 1941, the S.E.S. Advisory Board conveyed to the Premier a desire that the staff and laboratory facilities of the Bureau be made available to the Commonwealth

Government for the duration of the war. This offer was immediately transmitted to the Prime Minister and was implemented to a considerable degree.

In the Bureau's 1943 Annual Report, it was recorded that "Twelve staff members are in the fighting forces, and a further four members are engaged on special work in Commonwealth Government Departments". The Bureau's gross technical staff at that time was about twenty-eight, so the sixteen absent members caused a serious depletion. The loss would have been even greater if it had not been that the "reserved occupation" policy of the Commonwealth prevented further staff members leaving a food production industry to join the forces.

Several of the remaining country staff spent a lot of their time implementing the fertilizer rationing scheme. All cane farms were classified individually, and rations of fertilizer were allocated per acre to each assignment.

Seedling production was restricted or ceased altogether on Experiment Stations, and some areas of land not being used for that purpose were utilized for vegetable growing. The crops so grown were sold under contract to the Army.

The work of some of the Divisions virtually ceased for some years. From 1942 to 1945 Behne was the sole member of the M.T.D., and he was engaged on several investigations which were not related to sugar technology, as well as spending much time on administrative work. Hughes was the only pathologist left on the staff; and the advisory strength was at a low ebb.

Records disclose that, during some or all of those wartime years, Bureau technical staff were divided as follows :-

Active on Bureau work : Mungomery, Buzacott, Bates, Knust, McBryde,  
King, Bell, Behne, Hughes, von Stieglitz, Cassidy, Home;  
Seconded to Commonwealth work : Kerr, Clayton, Praeger and McDougall;  
In the armed services : Christie, Story, Skinner, Smith, Elliott,  
Humphry, Barke, Abbott, Pembroke and Steindl.

The Bureau did not lose any staff as the result of wartime action; but it did lose the services of a couple who decided not to return to the Bureau. One of these was the Director, Dr. H.W. Kerr who, after some two

years secondment to the Commonwealth (1943 to 1945), elected to join a commercial organization rather than return to leadership of the Bureau. The other was a mill technologist, Praeger, who also decided to join a commercial venture after wartime service with a Commonwealth flax unit.

Much of this decade was a period of extreme difficulty. The 1946 Annual Report recorded that all members of the staff who had been absent in the armed forces had once more taken up duties with the Bureau. The same report described the distribution of the field advisory staff as :-

Cairns	Bates, Humphry and Abbott
Innisfail-Tully	Knust
Burdekin	Christie
Mackay	Story, Elliott and Pembroke
Bundaberg	King, Skinner and Myatt
Maryborough-Moreton	Smith

In the previous year, 1945, a re-organization of the Department of Agriculture had some bearing on Bureau matters since the Bureau at that time was a branch of the Department. Bell, the then Director, was appointed Assistant Under Secretary in addition to being Director. Behne became Assistant Director and Chief Mill Technologist; and Mungomery was transferred from Meringa to Head Office as O/C Division of Entomology and Pathology.

Other appointments in the same year were Nicklin as Electrical Engineer (from Pleystowe Mill), Vallance as Chemist, and Sloan as Agronomist (both from Department of Agriculture). Simultaneously Clayton returned from his secondment to the Flax Committee.

In 1946 McBryde, O/C at Mackay Station, was transferred to the mill technology division at Head Office, and Story took his place. Buzacott took over control at Meringa following Mungomery's transfer to Brisbane. And both Venton and Brain joined the mill technology division.

The years 1947 and 1948 witnessed other important staff changes. Following Bell's appointment as Under Secretary in 1947, Behne became Director and King Assistant Director. But, early in 1948 Behne resigned to join Pioneer Sugar Mills and King succeeded him. Adkins joined the

mill technology division in 1948. In the same year, Clayton and Vallance both proceeded overseas, the former on a three-month study period in Hawaiian sugar factories and the latter to investigate the subject of soil deterioration under monoculture. Wilson was appointed as entomologist following Buzacott's change-over from entomology to plant breeding.

There was a continuation of staff build-up in 1949 and 1950. Bieske and Stern joined the soils and agronomy section, Claire, Yore and Doolan were added to the mill technology division; Anderson and Matthews were appointed to the advisory staff; Horne replaced Linklater as Senior Clerk; and Skinner was awarded an overseas scholarship to study genetics at Manchester.

By the end of the decade there had been a major transformation. The return of staff from wartime duties, and the intensive recruitment drive, had altered the staff position materially. As at the middle of 1950 the Bureau establishment included :-

Division of Entomology and Pathology	5
Division of Mill Technology	9
Field Staff (cane breeding and advisory)	16
Laboratory	5
Administrative and clerical	8

Field experimental work was once more in full swing, entomological and pathological work was proceeding normally, cane breeding activities were increasing, and the mill technology division was operating at full pressure.

The latter years of the decade were marked by two Bureau discoveries which, without anything else, would repay the industry for all monies it has contributed to Bureau funds. The first of these was the conquest of the greyback grub by the use of BHC, and the second was the discovery of ratoon stunting disease.

It is not necessary to repeat a lot of detail in either instance, since this is recorded in our publications. But brief reference is desirable.

In 1945 a few pounds of BHC dust (containing 1.5 per cent gamma isomer) were made available for experimentation at Meringa. This was applied at rates of 100 and 400 lb per acre in the half-open drill.

Within five months the new insecticide had demonstrated its efficacy. By the following season Pest Boards had ordered 120 tons of the material and, by 1953, it was recorded that 59,500 acres were treated in the one year against greyback grubs.

The r.s.d. discovery was made in 1949. Bureau pathologists had, for some time, been investigating the Q.28 trouble, as it was called. In 1949 it was established that this was a transmissible disease, spread by setts and by cutting implements, but apparently not spread by insect vectors or by soil. Within a very few years this disease was found to be in all cane-growing countries (or all where it was looked for) but had not been detected before the Queensland discovery.

To revert to the greyback-BHC matter, there is an interesting record in our files. At a conference of Cane Pest Boards at Ayr in 1940, Mungomery and Buzacott issued a list of all grub fumigants and poisons so far tried against the greyback grub. Included in that list was benzene hexachloride (BHC). This sample came from Mt. Lyell in Tasmania and Buzacott recalls that it was a small sample and would have been used only in pot tests. The material gave no promise of control so it can only be assumed at this late date that it contained little, if any, of the gamma isomer. The record is of interest because it pre-dates the discovery of the insecticidal properties of gamma-BHC by I.C.I. in England.

The year 1950 saw the beginnings of the new Experiment Station on the Lower Burdekin. This project was envisaged some three years earlier, but a suitable location, out of flood hazard and at a price the Bureau could pay, was difficult to find. Finally, through the good offices of Mr. G. Ashwell, then General Manager of Pioneer sugar mills, an area of Pioneer grazing land, adjacent to the Pioneer mill, was made available to the Bureau at very reasonable cost.

In the same year the Bureau, having a target of concentrating all disease resistance trial work in Brisbane (away from commercial cane areas), leased ten acres of the University's farm at Moggill. This project worked successfully during the period of the two-year lease. Simultaneously, it erected two new glasshouses at the Domain for pathology research, and for insect transmission studies. Both the lease at

the University farm and the glasshouses on the Domain had a limited life for the Bureau, as will be mentioned later.

All in all, this decade was a mixed bag. The staff shortages caused by the war brought research activities virtually to a standstill; the enlistments of farmers' sons and field workers, the internment of certain foreign-born farmers, the scarcity of tractors and implements, the rationing of fertilizer and the general shortage of all farming requirements depressed productivity. All track tractors, and the best of the wheel ones, were requisitioned for road and airfield construction, and it is little wonder that sugar production fell from 891,000 tons in 1939 to 486,000 tons in 1943, the respective cane per acre yields being 23.1 and 14.8.

But after the war there was intensive recruitment of new staff, re-organization of divisions, changes in administration, increased emphasis on cane breeding, agronomy and mill technology, and outstanding research victories in both pathology and entomology. It is not too much to say that, in the late 1940's, the foundations were laid for the Bureau's most productive period - the following twenty years.

#### The Sixth Decade. 1951 to 1960

Before departing too far from the previous decade, and getting involved in this one, it is desirable to record an event of great consequence which took place as one period merged into the next. It was the eradication of downy mildew disease from commercial cane plantings in Queensland. In the 1951 Annual Report the following appeared :-

"For the first time since detailed records have been kept not a single stool infected with downy mildew has been recorded anywhere in the cane fields of the State."

This was quite an achievement since, from time to time, downy mildew had occurred in every district from Mossman to Bundaberg. Curiously enough, it was never detected south of Bundaberg.

However, the sense of satisfaction was a little premature. In 1956 the disease was located on one farm in Bundaberg - a farm where it had not previously occurred. How it came there remains a mystery. The outbreak was cleaned up in 1957, and no further disease has since been sighted. The only sugar-cane downy mildew known to exist in Australia is in the resistance trial at the Pathology Farm.

From an historical point of view - and from many other points of view - the most important event of the decade was the severance of the chain which had for so long tied the Bureau to Department of Agriculture apron strings. This occurred in 1951.

Prior to the divorcement from Public Service control, the Bureau was a branch of the Department of Agriculture and Stock. The members of the staff were public servants; all expenditure was with Under Secretarial approval; and purchasing through State Stores was obligatory.

A brief mention of the break with government control was made earlier. The amending legislation received Royal assent on March 30th, 1951, and came into operation, by Proclamation, on July 1st of that year. The amending Act provided inter alia for future administration of the Bureau by the Sugar Experiment Stations Board, the transfer of all existing assets and funds to the new Board, and the fixation of staff salaries by the Board.

The original Board consisted of :

The Hon. H.H. Collins, M.L.A., Minister  
Mr. A.F. Bell, Under Secretary for Agriculture and Stock  
Mr. W.L. Poustie representing the canegrowers  
Mr. J.W. Inverarity representing the millowners.

Although somewhat out of place chronologically, it is perhaps appropriate here to record the changing personnel on the Sugar Experiment Stations Board up to the present.

Chairman :

The Hon. H.H. Collins	1951 to 1957	died 1962
The Hon. O.O. Madsen	1957 to 1965	died 1965
The Hon. J.A. Row	1965 to date	

Deputy Chairman :

A.F. Bell	1951 to 1958	died 1958
W.A.T. Summerville	1958 to 1964	
W.J.S. Sloan	1964 to 1965	died 1965
J.M. Harvey	1965 to date	

Canegrower Member :

W.L. Poustie	1951 to 1953	
L.G. Scotney	1953 to 1959	died 1959
B. Foley	1959 to 1960	died 1962
A.G. Mann	1960 to 1966	died 1966
E.C. Row	1966 to date	

Millowner Member :

J.W. Inverarity	1951 to 1968	died 1968
J.H. Webster	1968 to date	

The staff recruitment policy was continued between 1951 and 1955, but there were also some significant losses. Skinner returned from Manchester after completing the Ph.D. course in genetics; Hitchcock was appointed to the entomology division, Young to plant physiology, Barrie to agronomy, Deicke and Harland to mill technology, Pollock to pathology and Toohey, Rehbein, Moller, McAleese, Chapman; Rodman and Whitaker to the field staff. Venton and Clayton resigned from mill technology and McBryde died.

The second half of the decade witnessed further important staff changes with the appointments of Beale, Stewart and Galetto to mill technology, Sturgess to pathology and Arnold, Corkill, Stewart, Hucknall, Beak and Glover to the field staff.

The decade was not one of staff gains only; there were many resignations and replacements.

Perhaps the Mill Technology Division was most affected. Although Nicklin maintained continuity as engineer technologist, the other section of the division was successively in the charge of Clayton, Venton and Brain.

The period was a fruitful one for cane breeding results. In 1950 the latest numbered Bureau-bred variety was Q.51; by 1960 the approved list included Q.73.

Both the Bureau and the Colonial Sugar Refining Company have experienced outstanding successes in breeding commercial sugar canes. But the Bureau's efforts have been crowned with greater success in the more recent years. The respective contributions to the State's crop are shown in the following figures :

<u>Year</u>	<u>Bureau Proportion</u>	<u>C.S.R. Proportion</u>
1950	31.8%	32.5%
1960	46.3%	37.7%
1970	60.0%	13.5%

The entomology division pursued vigorously its work with BHC against grub damage. Timing, placement, dosage and persistence were investigated thoroughly. The subject of lindane versus crude BHC dust occupied some time; the former attained some popularity because of lower cost, but it proved to be less persistent than the crude product. The use of BHC against greyback grubs rose to a peak in the decade and then showed some reduction in area treated, but this was related to industry economics rather than to decreased need for control measures.

In this decade - following on the heels of the B.H.C. discovery in the 1940's - there was intense activity with many new, synthetic insecticides. The Bureau tested a great many by screening techniques, and some were used commercially on specific pests, or because of some local preference. Aldrin and heptachlor were two of these.

The funnel ant problem was solved with the discovery that aldrin, properly applied gave effective control.

It was within this period that a growth problem, first thought to be pathological, was defined in 1957 as being due to soldier fly larvae. In early trials at Dundaberg, where the problem was first apparent, BHC dust gave good promise. But the control was not 100 per cent, and field trials with this and other insecticides were still current at the end of the decade.

This was, by no means, the Bureau's first contact with soldier flies, but it was a new experience to observe the widespread poor ratooning, and the steady extension of the affected area. The

Australian Sugar Journal of August, 1925 records, in the Bureau's entomological notes :-

"Towards the end of February last complaints were received from Mackay regarding what appeared to be a new cane pest, said to be affecting the setts and retarding or preventing development of young shoots of ratoon and plant crops..... The insect in question proved to be Metoponia rubriceps, a small black fly from  $\frac{3}{8}$  ths to  $\frac{1}{2}$  an inch in length, with smoky brown wings, conspicuous red head and large, black rather prominent eyes..... At Finch Hatton, near Mackay, they were observed towards the end of May last in great numbers, especially, we are informed, over newly planted ground."

Again, in the 1932 Annual Report, Mungomery commented on a localised emergence of soldier flies. This was the occurrence on Fairymead Plantation which attracted some interest for a few years and was then forgotten until the outbreak in the 1950's.

The pathologists, in the early part of the period, had an understandable bias towards ratoon stunting disease control. The hot-water, curative treatment, at first a laboratory method, was extended to the field in 1952; and, in the following year, nearly all Cane Pest and Disease Control Boards were making a start to introduce control methods. Over 2,000 tons of cane were treated that year. The Bureau was then recommending 50°C for two hours, but later investigations led to a more conservative approach and a change to 50°C for three hours. A great deal of trial work was conducted to assess losses caused by the disease, and the pink blush diagnostic symptom was established.

Steindl spent some time at the virus school of Berkeley University (California) studying virus isolation and detection techniques, but none of these led to improved recognition methods in Queensland.

During the decade there was a change from sett treatment in wire baskets to stalk treatment in slings - the latter allowing the use of cutter planters equipped with either baths or sprays for mercurial application.

This was also the decade of the leaf scald outbreak in Bundaberg - a mystery still not clearly explained. Leaf scald was previously seen for the last time in that district in 1933 in the variety Mahona. In the 1950's some Q.63 was introduced from a clean source (the Experiment Station) in Mackay. In 1960, 15 farms at Bundaberg were found to have Q.63 infected with leaf scald. All blocks were destroyed after harvest and there has been no further finding of the disease. Q.63 has not been re-introduced or re-propagated in that district.

It is not usually remembered that a resurgence of leaf scald occurred in Mackay at the same time. The 1960 Annual Report says "..... but the larger sugar districts of Bundaberg and Mackay have been apparently free from the disease for a quarter of a century or so. It was therefore somewhat surprising to find infection during autumn, 1960, on a number of farms at Bundaberg and Childers, and at Mackay and Proserpine. The chief variety involved was Q.63."

In the light of present day knowledge of alternate grass hosts, it might logically be accepted that the distribution of Q.63 introduced a new degree of susceptibility to the disease, and that it rapidly became infected.

In 1957 Steindl reported the identification of a new disease "Bacterial Mottle". This was the affection which C.S.R. officials in the Herbert River had been reporting as "root disease" for the previous ten years, but with which no organism had been associated.

Chlorotic streak studies were given priority in the late 1950's and considerable advances were made in knowledge and understanding of the disease; these continued well into the next decade and resulted in much, new published work by Sturgess and Egan.

Research agronomy never really got off the ground in the 1950's, despite the appointments of Haskew, Stern, Wesdorp and Barrie, although the lastmentioned began to make some impact in this field before 1960.

In 1951 the Bureau, cane-collecting expedition to New Guinea took place. Quite late in the planning Dr. J. Warner of the Hawaiian Sugar Planters' Association genetics division sought per-

mission to join the party. The Bureau personnel who planned and executed the cane collecting were Buzacott and Hughes. Varieties, both noble and wild to the number of 162, were collected and air-freighted to Brisbane. Satisfactory open quarantine was arranged at Redlands.

Bureau staff had not personally played a part in cane collecting expeditions but in 1912, the Bureau was responsible for sponsoring and organizing the Wells expedition to New Guinea. Wells was a Childers cane farmer. He collected 158 varieties, all of which were planted at Mackay.

It was in the 1950's that the Bureau did its first work on deterioration of cut-up cane. This was inspired by the first demonstration of a Massey Ferguson chopper harvester at North Eton in 1957. Following the demonstration a discussion took place that evening between M.F. engineers and the Bureau Director when the latter mentioned that the Howard chopper harvester, built and used on Fairymead in 1935, was not proceeded with because of serious "juice losses". It was then proposed, and the Director accepted, that the Bureau conduct deterioration trials in 1958. This was done in four cane areas, at three different times in the season, and with a range of cane varieties.

It was not until 1961 that marked deterioration was noticed at a mill and, in 1962, Mulgrave mill sought an investigation by the Bureau. That led to the large scale and intensive research carried out by Egan in subsequent years, and to the control and minimisation of losses brought about by transport rostering, burning control, and elimination of stale cane.

#### The Seventh. 1961 to 1970

This was a period of great expansion - staffwise. Records show the appointment of 48 technical officers. These were not all additions; naturally, there were many losses. But the net gain to the establishment was very considerable. In terms of divisions the additions included :-

Plant Breeding - Hogarth, Berding, Pollock, Barnard, Braithwaite,  
Garioch, Willcox and Anderlini.  
Pathology - Persley, Ledger and Arkadieff.  
Entomology - Redhead, Bull and Chandler.  
Soils and Agronomy- Ridge, Stickley, Hurney, Ham, Haysom and  
Kingston.  
Mill Technology - Atherton, Batstone, Nix, Kirby, Noble, Stewart  
and McIntyre.  
Advisory - Hampson, Tilley, Powell, Copley, Usher, Nalder,  
Rudd, Ford, Reimers, Currie, Webb, Izatt, Chardon,  
Cullen, Hetherington, Nielsen, Spry, Downs, Jones,  
Wright and Linedale.

The period covered a major expansion of the industry in the course of which the gross assigned area was increased by 25 per cent and some 1,200 new cane farms created. The Bureau had to expand concurrently, but not necessarily to the same extent. For the first time in Bureau history it was considered by its administrative officers that it possessed adequate staff to perform a worthwhile service in all divisions and, particularly, that there were sufficient advisory and extension men to give a good coverage in all mill areas. In 1961 there were 20 advisory officers (including Officers in Charge of Experiment Stations) for 31 mill areas; in 1970 there were 35.

Plant breeding successes continued in a steady stream. Whereas, in 1960, the lastnumbered "Q" cane was Q.73, by the end of the decade the figure had advanced to Q.91. Some of these later releases have made considerable impact already, as exemplified by Q.80's meteoric rise since 1965.

In 1965 a fairly modest controlled climate house was constructed, primarily for wild cane flower control. And, during the decade there was some emphasis - distinct from the routine cross-pollination and seedling raising and testing programme - on the research side of selection procedures.

The decade witnessed several changes in emphasis in the disease field. Although r.s.d. remained with the industry as unchallenged tonnage destroyer, there were several other problems to engage pathologists' attention. Perhaps the one to create most interest and concern - because it involved both miller and grower - was cane deterioration following chopper

harvesting. The upsurge in leaf scald in the Pleystowe area, in Q.63, caused many anxious moments, a court prosecution and, finally, an Act amendment. But it became apparent that the disease is not likely to be effectively controlled, much less eradicated, while Q.63 remains as an approved variety.

The recurrence of Fiji disease in Bundaberg in 1969, after a believed absence of sixteen years, caused speculation regarding its source. Although an illegal introduction of cane was a possibility, it is now thought that the most likely explanation is a carry-over of disease since the last campaign. It is almost unacceptable that detection was so long-delayed, and it does point the bone at the inspectorial staff of the Cane Pest and Disease Control Board. But whatever the source of the disease, the problem is now a very serious one and justifies doubt as to whether the variety N.Co.310 can continue to be grown without restriction. Egan was transferred to Bundaberg in January, 1972 to direct and supervise the campaign; and the activities of Bull, resident entomologist, were directed largely towards leafhopper studies and control measures.

In the entomology division, there were major advances, and also many staff changes. Hitchcock was transferred to Mackay to concentrate on the soldier fly problem there, and Bull was appointed to Bundaberg to handle the increasing insect pest occurrences in the south. Chandler replaced Hitchcock at Meringa.

The outstanding industry problem in this field was the soldier fly which infested large areas in Bundaberg and Mackay. Intensive research and a great many field trials brought about a switch from BHC to dieldrin as a control measure, because of greater reliability and the more persistent nature of the insecticide. Progressively there were fewer and fewer cases of ineffectivity and it is now accepted that correct timing, dosage, and incorporation will protect all plantings.

Persistence studies, conducted in the Bureau laboratory, demonstrated that the carry-over amount per acre after second ratoons is such that insecticide applied to the soil prior to the next planting could be reduced from six pounds to four pounds dieldrin per acre.

Such new problems as wart eye and cicadas cropped up, but in neither case has work proceeded far enough to give promise of control.

Rats received a lot of attention. A zoologist trained specifically for the project did not stay long enough to make much impact, but a second one made some very useful studies in the latter few years of the period. There was, concurrently, an industry move towards aerial application of rat baits.

There was, publicly, a much greater awareness during the decade of chemical pollution of the environment; and, although insecticides incorporated in the soil have barely been mentioned, there are long odds that increasing publicity will be given to the very large amounts of such persistent chemicals being used by the sugar industry. Dr. Endean did have one crack which attempted to link insecticide usage in cane-growing regions with the crown of thorns starfish on the Barrier Reef, but it is doubtful if it had any impact.

In no previous period of Bureau history were senior staff losses so heavy - but principally by retirement. The move began in 1963 with the resignation of Brain. Then, successively, came Vallance in 1964, Bates in 1966, Mungomery in 1968, Nicklin in 1969, Buzacott in 1970, and Wilson in 1971.

Losses by death in the period were Barrie (agronomist) in 1964, Claire (mill technologist) in 1967 and Young (plant physiologist) in 1970.

The Assistant Directorship suffered some changes. With Vallance's vacation of the position in 1964, Mungomery took over until 1968, when he was succeeded by Sturgess. The classification of Assistant to Director was allowed to lapse with Sturgess's promotion to Assistant Director.

The agronomy division really got a move on in this decade. Leverington took over this responsibility after the retirement of Vallance and, by the end of the period, he had a team of agronomists consisting of Chapman, Moller, Hurney and Kingston, as well as Ridge and Ham as soils technologists. Concurrently the soil analytical staff was also increased; Haysom took charge at Mackay, and Stickley specialized in insecticide residues in soils and other materials. A large increase in nutrition trials took place but, in the main, as a research activity rather than as routine testing on specific soil types. Time was spent on silica-growth investigations; research on irrigation scheduling and water requirements of cane was emphasised; infiltration of Lower Burdekin soils, and soil

ameliorants were studied; another look was given to row spacing; long term ratooning investigations were conducted; water-table studies were performed in the super-wet area; and extensive herbicide assessments were performed.

It was in the early 1960's that a decision was made to prepare a second edition of the Manual of Cane Growing. The first edition in 1953 came about as the result of an approach by Angus and Robertson for the writing of a "manual" which would become a unit of the "Australian Agricultural and Livestock Series". Ten years later, when the first edition became somewhat outdated and in short supply, the Sugar Experiment Stations Board decided on a second edition - particularly since there would soon be 1,200 new cane-growers.

The new edition was considerably enlarged, very profusely illustrated, and extended the original authorship to include several other staff members.

The 1964 expansion, mentioned previously in another context, utilized Bureau staff and know-how in many directions. The Director was one of the three members of the Gibbs Committee of Inquiry, on whose report the expansion was planned and carried out. In each district a land selection committee was set up, and these all included, in an expert advisory capacity, a local Bureau officer. Many of the staff participated in a practical and consultative capacity in almost every phase of the expansion.

The Mill Technology Division continued its instability from the previous period. Staff changes were frequent and the lack of continuity in leadership imposed a severe handicap. Successively in the seventh decade the technology section of the division was led by Brain, Anderson and Atherton, while Nicklin continued through to 1969 as Chief and Engineer Technologist. But since 1966 when Atherton became the sectional leader (and later the Chief) stability returned and staff appointments gave more strength to the division. The entire staff (excluding the metrology branch in Head Office) is now in the country centres, with the main strength at Bundaberg, and two members at Meringa.

Head Office, The Pathology Farm and The Experiment Stations

Head Office

In writing some notes on these matters, chronology is not important so, instead of beginning with Mackay - the oldest, a start will be made with Head Office.

When, as mentioned earlier, the Bureau's administration moved from Bundaberg to Brisbane following Maxwell's resignation, the General Superintendent occupied an office in the Department of Agriculture and Stock building, and the chemists used facilities and space in the small building occupied by the Agricultural Chemist; this was just near the present Public Library. At a later date the Agricultural Chemist moved into new quarters in the Agriculture and Stock building, and von Stieglitz - by that time the Bureau's only soil chemist - continued to work in that laboratory.

It was 1930 before the Bureau obtained its own quarters in Brisbane. A new extension of the Agriculture and Stock building was planned but the approaching economic depression and the shortage of Government funds resulted in the Bureau paying for its section of the building out of the Sugar Fund. This created a situation probably unique in State Government history in that an industry body owned and occupied portion of a Government office building. Normally all State Government office buildings are constructed by the Department of Public Works and are paid for out of consolidated revenue.

For the period 1930 to 1958 the Bureau continued to occupy this floor space. But in the 1950's - particularly following the Bureau's divorcement from the Public Service - there was a growing realization that it would soon burst at the seams. Simultaneously, the Department's demand for space was growing rapidly, and it was realized that the Bureau would have to find new quarters.

At this time there developed the concept of a "sugar house" in Brisbane in which all sugar industry organizations would be accommodated. Some initial discussions were held but it was soon realized that there were considerable obstacles to overcome, and that unanimity in regard to site was unlikely of achievement.

So the Bureau began to look for land in a suitable location. It was not necessary to be in the commercial part of the city. The site of our present headquarters was an attractive one, and it was purchased complete with the two-storied boarding house which stood on it. The cost was £12,500 and the area of the land 1 rood 39.1 perches.

Architects were engaged to design a new building from the rough floor plans prepared by our own staff and we occupied the new quarters in November, 1958 after an official opening by the then Premier of Queensland, the Hon. G.F.R. Nicklin.

During thirteen years of occupancy there have been ample opportunities to detect planning weaknesses, and it is remarkable that there are so few. Virtually no changes have been made to the structure, and only normal maintenance has been necessary. The sole addition was an extra stationery store in the basement. The gross cost of this building, including the quarantine house, and the elevator which was installed in the shaft some time later, was £103,671.

When this building was erected, there was little space not occupied. But this was by design. It was visualized that the Bureau staff would continue to grow, but it was planned that the growth would be in the country, and not in Head Office. However, growth in Head Office did take place, principally for two reasons - the expansion of laboratory work, and the fact that more country technicians demanded more administrative office work.

When the new building was first occupied, there were 26 on Brisbane staff. To-day the building houses 27 but three of the pathology staff were transferred to the Farm in the interim, and there are two less mill technologists at Head Office than in the first days of its occupancy.

It is unlikely that extension of the Head Office building would become necessary but, in such eventuality, there is room for a small wing, three floors high, at the rear of the structure.

#### The Pathology Farm

In the earlier periods of Bureau history, it was not uncommon to conduct some disease resistance trials in cane-growing districts. This, in itself, was an indication that a particular disease was so widespread

that no extra risk accrued from deliberately planting diseased material in a trial. In the late 1920's and early 1930's gumming resistance trials were planted on the Bundaberg Experiment Station and the writer recalls inoculating such trials with the gumming organism. The first leaf-scald trial was at South Johnstone in 1930; there was a downy mildew trial at Ayr in 1933; and the first Fiji trial was at Eagleby in the same year. Downy mildew trials continued to be conducted in Bundaberg - some two miles from commercial cane - until 1952.

Although the Domain area in Brisbane had been used for some years for certain disease resistance trials, a move was made in 1950 to centralize such testing in an isolated location, while still retaining travelling convenience for pathologists. This concept was hastened by the alienation of Domain land for building purposes.

The University farm at Moggill, allocated for use by the faculty of veterinary science, was not being fully utilized, and the Bureau was able to lease ten acres of relatively flat country for disease resistance work. This arrangement continued for two years, when the University terminated the lease. The pathologists sought alternative accommodation in a suitable and not-too-distant location, and recommended the purchase of what is now the Pathology Farm, but which was then a commercial farm partly used for pawpaws and small crops. It has an area of 58.75 acres and the purchase price was £6,000.

Since its purchase in December, 1951, the "farm" has been extensively improved. The original farm cottage was replaced by a new dwelling, a large glasshouse was erected and, more recently, an office-laboratory building was constructed. The last-mentioned was part of the plan to make the "farm" the headquarters of the pathology division. All plant pathology equipment was transferred to the "farm" and the Head Office laboratory and ancillary workrooms handed over to the soils division. Mr. Hughes, Chief Pathologist, remains in Head Office for administrative purposes.

The Pathology Farm is more than a site for disease resistance trials. It is a field and laboratory and glasshouse research centre for pathology investigations, and it has become the repository for a collection of obscure and not-so-obscure ailments of sugar cane, as well as a wide range of genetic aberrations. During refresher courses for our own staff

or for staffs of Cane Pest. and Disease Control Boards, the work at the pathology farm forms an important section of the courses.

Currently (early 1972), the farm is the headquarters for Steindl, Arkadieff and Miss Persley.

Mackay Experiment Station

The introduction to these notes explained how, in 1899, the State Nursery at The Lagoons, Mackay was done away with, and the site used for a Sugar Experiment Station. This preceded the legislative moves which led to the passing of the Sugar Experiment Stations Act of 1900, and the creation of the Bureau of Sugar Experiment Stations.

Much of the Bureau's early field experimental work was conducted on The Lagoons property. Indeed, virtually all of the Bureau's field and laboratory testing of cane varieties was carried out at this location, for a considerable number of years. And the Station was also used - as described earlier in the first two decades - for the initial experimentation with fertilizers and cultivation methods and legume crops. But it possessed an inherent disadvantage for experimental work - it was too uneven both topographically and production-wise. And additionally, it was too small to serve adequately as a full-scale experimental area. There were 45 acres of arable but uneven land.

The Annual Report for 1933-34 mentions that negotiations were finalized for the purchase of an area of Palms Estate, adjacent to Te Kowai Siding. This was an area of 70 acres, described as a fair average sample of the cane lands of the Pioneer valley. It was anticipated that the new Station would be ready by late 1935, and this was, in fact, achieved. The chemical laboratory and some outbuildings were transferred from the old site to the new, and two new residences were provided. The old Station was disposed of as a special lease.

It is of interest in these days of inflated values placed on farming land to record some details of this purchase. The then owners of Palms Estate, Australian Estates and Mortgage Co. Ltd., had decided to relinquish their interest in cane growing and to subdivide the property into farms for sale. Dr. Kerr who was then Director, persuaded the Advisory Board to purchase one parcel for an Experiment Station and he selected the area which the Bureau now occupies. It was one of the worst blocks but it was the Director's opinion that the Bureau should attempt to demonstrate correct cultivation procedures on poorly-drained, second class soil. To-day, with hindsight, it is felt that the Bureau could have done a better job for the district if it had operated on a better class farm.

The terms of sale of the land, as laid down by the vendors, were that ten acres were a donation to the Bureau. On the remaining area, the cost was calculated as follows :

59 acres 2 roods 39 perches @ £20	= £1,194.17.6
10 chains fencing	= £ 2. 0.0
Preparatory work on 51 acres	= £ 160. 0.0
	<hr/>
	£1,356.17.6
	<hr/>

The vendors then accepted 20 per cent of the purchase price as deposit, and the balance spread over a period of seven years with interest at  $4\frac{1}{2}$  per cent.

In 1938 the seedling-raising glasshouse was constructed on the Station and this unit still continues to function satisfactorily and adequately after 34 years. This glasshouse is identical with the Bundaberg one - built a year earlier - and both were constructed to Public Works Department plans and specifications after the basic design had been laid down by the Bureau. Original heating was by coke-fired boiler and circulating hot water, but at a later date this was changed to electrical heating strips around the walls.

By 1955 it was realized that the increasing staff and the need for improved office and laboratory facilities, necessitated a new building. The older one originated at The Lagoons in 1898, and had outlived its usefulness. By 1956 a new building was constructed, incorporating a soils laboratory. It was anticipated that the new structure would look after Mackay's requirements for a long time, but the foresight did not extend far enough to include the 1964 expansion, nor the resurgence of entomological activity. So 1971 witnessed a considerable extension of the 15-year-old building, including several new offices, a considerable enlargement of the soils laboratory, and the addition of a library-cum-conference room.

The original Station office building was purchased by Mr. G. Windsor in 1958, and he converted it into a residence on the southern bank of the Pioneer River - about 200 yards from the present memorial cairn to John Mackay.

During the period the Bureau has operated in Mackay, the Station has been managed by :-

H.T. Easterby	1901 - 1910	The Lagoons
L.C. McCready	1910 - 1917	"
J.L. Foran	1917 - 1919	"
F. Keogh	1919 - 1935	"
D.L. McBryde	1935 - 1946	Te Kowai
C.G. Story	1946 to date	"

When Experiment Stations were cultivated with "four-legged" horsepower, there was need for a resident ploughman, one of whose duties was to feed the horses before and after working hours. These days there is no need for one of the labour force to live on the property. At Mackay, where a ploughman's house existed, it was extended and improved and is now occupied by the District Adviser.

An entomological laboratory was established at the Station in 1928 with A.N. Burns as the resident entomologist. This move was inspired by the crop losses which resulted from wireworm and grub attack. Burns resigned in 1930 and his place was taken in 1931 by McDougall who functioned as district entomologist until his transfer to the Department of Agriculture in 1948. In 1935, following the widespread alarm caused by the Weil's disease outbreak in the far north, McDougall's activities were concentrated on a study of the rat pest and, ancillary to that study, a rat dormitory was erected on the Experiment Station.

From 1948 to 1967 there was no entomologist at Mackay. Then the upsurge of soldier fly damage led to the transfer of Hitchcock to Mackay to study that pest's life history and to engage in general entomological duties. Soon afterwards, he felt the need for an insectary - but of an unusual type. This is totally enclosed and equipped with air conditioning and artificial lighting control.

The name Te Kowai creates some interest since it suggests a Maori or Polynesian origin. According to the Mackay Mercury the name Te Kowai was given to the area and to an early sugar mill by T.H. Fitzgerald, a pioneer cane grower and member of Parliament, who surveyed the original settlement of Mackay. The name comes from kowhai, a New Zealand yellow-flowering tree.

Bundaberg Experiment Station

The introductory section of these notes refers to the administrative headquarters and soils laboratory which Maxwell occupied in Bundaberg in the first decade. But this was not the beginnings of the Experiment Station. When the office and laboratory, located on the bank of the Burnett River, was closed in 1910 the Bureau ceased to be represented in Bundaberg for some time. Later, the Bureau's building was transferred to the site of the High School in Maryborough Street and ultimately became a chemistry laboratory within the school complex. It was the building in which sugar chemistry classes were held over a long period.

In 1913 the Bureau acquired a property for a sugar experiment station. This property, a self-contained cane farm of 45 acres, had been a cane-growing property since (we are told) the 1870's. It was owned for most of the time by the Williams family.

When it became known that the Government was interested in obtaining a property for a sugar experiment station this property - "Margam" was one of the many offered.

Incidentally, the name "Margam" is still used by many Bundaberg sugar people. The origin of the name is not known definitely but it is believed that the Williams were Welsh. There is a town named Margam in Glamorgan, Wales.

Bureau records show that the property was purchased from H.L. Mikkelsen, but there is an interesting story which used to be frequently related in Bundaberg. It was that, as soon as the Government evinced interest in this farm, an estate agent named Mikkelsen purchased the farm from Williams. He then added £1,000 to the selling price and made a condition of sale that he - Mikkelsen - harvested and received the proceeds of the 1913 crop.

The price paid by the Bureau for the property in December, 1913 was £2,500.

Since writing the above notes, a search of Titles Office records disclosed the following information :

- (1) The 45 acres of land comprising Por. 49, and constituting the area of the original Experiment Station, was the subject of land purchase from the Crown on June 29th, 1872.
- (2) The purchaser was John Warburton, and the purchase price was £8.2.6.
- (3) Warburton sold to Franz Kuhnel on June 18th, 1878.
- (4) Kuhnel sold to Thomas Williams on June 8th, 1881.
- (5) The estate of Williams sold to Hans Ludwig Mikkelsen on June 9th, 1913.

It is noted that Mikkelsen held the property for only six months prior to selling to the Crown for a sugar experiment station.

Unfortunately, these records give no clue to when the property was first used for cane growing.

Bureau files contain a list of laboratory requirements made out by Easterby and Brunnich at that time, for equipping a sugar laboratory in one of the farm buildings. The list contained such items as :-

Schmidt & Haensch half shadow saccharimeter	£25. 0. 0
Balance of 1000 gm capacity	£ 2.12. 6
Analytical weights	£ 18. 0
3 Brix spindles with thermometers	£ 15. 0
Laboratory juice mill	£18. 0. 0

Easterby took up residence on the Station in November, 1913, a month before the legal transfer took place. However, his tenancy was not of long duration. Late in 1915 he recommended to the Under Secretary, and it was approved, that he transfer to Brisbane and make that the administrative headquarters.

Pringle, then assistant chemist, was appointed Chemist in Charge at Bundaberg and became responsible for Station management. He retained that position until March, 1937, when he was transferred to the Agricultural Chemical Laboratory in Brisbane.

The successive Officers-in-Charge of the Experiment Station were :-

H.T. Easterby	1913 - 1915
J. Pringle	1915 - 1937
N.J. King	1937 - 1947
H.G. Knust	1948 - 1963
S.O. Skinner	1963 to date

At the time of purchase of the Station the buildings consisted large residence located immediately west of the still existing Norfolk Island pine trees; a ploughman's cottage immediately south-west of the well which still supplies the domestic water requirements; a barn plus fertilizer silo and a line of stables. All of these structures, except the ploughman's cottage have since been demolished; the cottage was moved to its present location in the 1930's.

Prior to 1938 the Works Department condemned the manager's residence and refused to perform any further repairs. So, in 1939, a new residence was constructed nearer to Ashfield Road. The old one was sold for removal; its site was used to build three cottages in the Millbank area.

Until 1925 there was no office-laboratory building on the Station. Mr. Easterby used a room in his residence as an office, and the juice laboratory was located in the barn. In 1925 a wooden building was constructed as an office, and juice laboratory. In the following year, with the transfer of Mungomery from Meringa, part was allocated for entomological studies, and an insectary was built at the rear.

This building has been subjected to several changes. Part was equipped as a soils laboratory for King's use between 1935 and 1947, and was subsequently refurbished as a mill technology laboratory. Considerable alterations and extensions were made in 1954 and again in 1966 to cope with the increase in field staff and with the development of the Station as mill technology headquarters. But even with such additions, it became apparent a few years ago that a new building was essential for adequate housing of staff and for provision of essential amenities.

A two-storied brick building was therefore erected in 1971-72 immediately in front of the old wooden one. The latter's condition was too good to allow of its demolition, or sale for removal, so it is retained for use solely by the mill technology division.

The Bundaberg Station acquired its glasshouse in 1937. The contract price for the glasshouse was £288, but the Bureau installed, in addition, a coke-fired boiler and the four-inch hot-water pipe system. This latter has been replaced by electrical heating.

Being in a low rainfall area, the need for irrigation to ensure the growth of certain blocks of seedling canes was realized fairly early. A

drilling programme in the 1930's failed to find a good water supply, although bores were put down to a depth of 140 feet. The best obtainable was a shallow supply - between 20 and 50 feet - in decomposed basalt, and the pumping rate varied between 4,000 and 9,000 gallons per hour. In drought years, when most needed, it became so poor a supply that only intermittent pumping could be practised.

During the 1960's, after it had been discovered in the Woongarra area that another aquifer existed below the previously explored depths, the Station tapped a good supply at approximately 240 feet and this was developed with a deep-well electric pump.

When the first irrigation plant was installed, the reticulation to high points on the Station required a closed pipe system. This requirement started a rather unusual exercise.

In the very early days of the industry in Bundaberg there were many juice mills in the Woongarra which crushed cane, limed the juice and pumped it into Millaquin mill. When this system was terminated, the underground cast-iron pipes were, in many areas, not removed. The Bundaberg Station obtained Woongarra Shire Council permission to dig out any such pipe it could locate on Windermere Road. A good deal was found at 12 to 18 inches depth along the road verges, the lead joints burnt out and the pipe transferred to the Station. It was in first class condition with a coating of the original tar on the outside and a uniform coating of lime from the limed juice on the inside.

The Bundaberg Station, situated on an excellent quality red basaltic loam, is ideally suited to many types of experimental work. But the available area (about 38 acres of the gross 45 acres) was too small. For some years the Bureau had its eye on the adjacent farm which was equal in size, and owned by Henry Keiser. Eventually, the owner decided to sell and gave the Bureau the first option to purchase; however, he retained a strip along the Bargara Road which he subdivided and sold as allotments. In all, the Bureau gained 35 acres in the deal, so it now possesses a Station of aggregate area 80 acres.

This allowed some expansion of the seedling programme, provided space for some particular experiments by the cane breeding division and made land available for some agronomy investigations. The purchase price of Keiser's farm, approved by the Central Sugar Cane Prices Board, was £55,500.

Meringa Experiment Station

Meringa, in the aboriginal dialect, means "red soil". It is a pity that the Experiment Station was not all red soil of the quality of the block south of the new building.

The beginnings of Meringa Experiment Station were referred to in the "second decade" notes, when discussing the transfer of the entomology headquarters from Nelson to Meringa. The area at Meringa was Crown land - in fact it was delineated on the Parish Map as a prison reserve. Bureau records for this period are far from complete, and our files do not disclose the lead-up to this transfer from Nelson. But the Annual Report for 1916 contains a puzzling comment; it reads :-

A Bill is now before Parliament giving the Minister for Agriculture power to proclaim any area "grub infested", and to levy a sum of not less than one penny per ton of cane, which is to be applied in such manner as may be thought proper in the destruction of cane grubs and beetles, the payment of entomologists, the erection and equipment of buildings and laboratories, and the conducting of enquiries, researches, and investigations in connection with the grub pest.

It is proposed to erect such buildings on Crown land at Meringa, a station on the Cairns-Babinda Railway about 2 miles from Gordonvale on the Cairns side. A suitable location has been chosen and sufficient land has been reserved to enable field experiments to be carried out.

There is no later mention of this matter and we can only assume that the Bill was not passed, since page 1 of "The Sugar Experiment Stations Acts" does not show any amending Act in 1916.

The Bureau's Annual Reports of those times were models of detail in respect of experimental work performed, but they lacked a lot of information relating to Station development. However, the Australian Sugar Journal of 1917-18 mentions, in several places, Illingworth's arrival (his salary was £1,000 per annum), the beginnings of the Station, and has photographs of the buildings which were erected. These included Illingworth's residence (since then occupied successively by Jarvis, Mungomery, Bates, Buzacott and Skinner); the Assistant Entomologist's residence, later to become a soils

laboratory in 1935 and, finally in 1969 to be sold for removal and replaced by the present two-story brick building; Illingworth's laboratory which was converted into a ploughman's residence in 1935, and in 1955 remodelled into the plant breeding laboratory.

The original area known as R.502, which constituted the entomological station, had an area of ten acres, and this area remained unchanged until 1934. In that year a decision was made by the Advisory Board, on the recommendation of the Director, to transfer the operations of the South Johnstone Sugar Experiment Station (which had functioned since 1917) to Meringa so that the Bureau's northern operations could be more effectively co-ordinated and more efficiently performed.

More Crown land - Portion 78 Parish of Grafton - was acquired, the area being 41 acres 2 roods 8 perches, in addition to the existing ten acres. More buildings were necessary and, in 1935, the combined stable-barn was erected and also a labourers' quarters which later was extended to become a second residence on the Station.

During the intervening years further areas of land were purchased to extend the arable acreage. The largest of these was Lavell's, approximately 17 acres. Meringa is the only one of the four Experiment Stations which is not completely freehold; some of the area is held as perpetual lease.

The Meringa soils laboratory had only a brief life before this activity was transferred to Brisbane. From being initially an entomological centre it became, additionally, the headquarters for all Bureau cane breeding; and, as time progressed, it came to be the north Queensland centre for plant pathology, agronomy and mill technology.

The growth of staff and activities soon put pressure on the office and laboratory space. And, in 1962, a new brick building was erected to relieve the pressure. Then, some seven years later, the old, wooden office-laboratory (originally the Assistant Entomologist's residence) was removed, and another brick structure of two stories erected in its place.

Since Meringa is, in the main, a cane breeding station it possesses some structures closely allied with that work. The original glasshouse erected in 1935 was destroyed by a cyclone in 1956, and was replaced in the following year by an imported, prefabricated unit. A temperature and

humidity controlled climate house was added in 1965 to assist in wild cane hybridisation. And the crossing area contains specially designed racks for cross pollination and for arrow drying.

Meringa is probably the best known of the Bureau Stations. Its standing stems from the outstanding achievements in insect pest control; through its being the point of origin of all "Q" cane varieties; and because it is the Station most visited by tourists and by V.I.P.'s, both Australian and foreign, who find their way into tropical Queensland. There are some well-known Bureau names which will long be associated with Meringa - including Mungomery, Buzacott, Bates and Wilson; all made valuable contributions to the sugar industry, and to the reputation of the Bureau, in their particular fields.

During the period of Meringa's existence it has been administered successively by :-

J.F. Illingworth	1917 - 1921
E. Jarvis	1921 - 1934
E.J. Barke	1934 - 1938
R.W. Mungomery	1938 - 1945
J.H. Buzacott	1945 - 1947 ) 1966 - 1970 )
G. Bates	1947 - 1966
J.C. Skinner	1970 to date

Although situated in a relatively high rainfall belt - 73 inches per annum - Meringa has an irrigation water supply to ensure successful transplanting and good early growth of original seedlings during late spring and early summer months. In earlier years the Station also provided its own domestic water, but switched over to the Behana scheme when that became available.

One of Meringa's proud possessions is the bronze plaque, mounted on a large granite boulder, near the Station entrance. The plaque was presented to the Bureau by the Chairman of the Queensland Cane Growers' Council, Mr. Ben Foley, in 1957. The wording on the plaque reads :-

"This plaque was presented by the Queensland Cane Growers' Council in recognition of the major service performed by the Bureau of Sugar Experiment Stations to the canegrowers of Queensland in initiating and carrying to fruition the research which led to the successful control of the cane grub, the industry's worst pest."

Mr. Arthur Bell received the plaque, as Deputy Chairman of the Sugar Experiment Stations Board.

It was a happy circumstance that, on the occasion of the presentation, the Right Hon. the Prime Minister (Mr. R.G. Menzies) who was visiting Cairns to open the Annual Conference of the Queensland Cane Growers' Association, was able to attend. He, also, spoke at the presentation function and concluded his remarks by saying :-

"This plaque here to-day is a tangible reminder of the work done inside this Station, whose results can be seen so abundantly outside the gate."

Lower Burdekin Experiment Station

The genesis of this Station is found in a report by the then Director, Mr. A.F. Bell, to the Sugar Experiment Stations Advisory Board on June 26th, 1945. In this report the Director pointed out the advantages of a Station in the delta area, and some of the problems peculiar to this irrigated district. He suggested "that the Board authorise the necessary steps being taken to acquire a suitable property on unassigned land."

Some time was spent in this search and both King and Vallance inspected several properties which were suggested or offered. None of these was fully satisfactory. Finally, through the good offices of one of the Advisory Board members, Mr. J.W. Inverarity, the Managing Director of Pioneer Sugar Mills, Mr. G.R. Ashwell, offered to sell a parcel of land, of approximately 90 acres area, for the sum of £1,450. One of the conditions of this sale was that, if at any time the Bureau decided to dispose of the property, the Pioneer Sugar Mills Ltd. should have the first offer.

There was no prior record of an irrigation water supply on the land. During the negotiations for purchase six bores were put down on the block but no satisfactory supply was tapped. Finally, several bores situated some 150 yards outside the boundary of the site - on Pioneer land, tapped a satisfactory supply. Resulting from this water survey, arrangements were made with Pioneer to include in the sale of land to the Bureau the 14 acre block east of the Pioneer Mill private road, on which the satisfactory water supply had been found. The final area, after survey, was 90.09 acres, and the purchase was finalised during 1948.

Two later changes affected both the Station land, and the water supply situation.

In January, 1969, because of the deteriorating water supply from the irrigation pump it was decided to have further bores put down in the hope of tapping a different water source. After several abortive attempts a site between the Townsville Road and the isolation plot gave a test pumping of 45,000 gallons per hour. This was the location of a second pumping unit. The screened section of the casing was between 77'6" and 89'10".

In 1962 Pioneer Sugar Mills expressed a desire to exchange some land; this concerned the 14 acre block mentioned above which included the irrigation bore and pumphouse. The Bureau was not using this area, but part of it was of value to the Company since it included the end of a long lagoon used by the mill for water cooling and re-circulation. They offered to exchange an equivalent area on the western side of the Station property. This was finally agreed to, the Bureau retaining 0.5 acre of the 14 acre block, so that the water supply and pump would be on its own land.

Following the purchase of the Station property, steps were taken to construct an office-laboratory building and a residence for the Officer in Charge. The latter was completed early in 1950, an implement shed constructed late in the same year, and the office building in 1952.

This property was not a stranger to sugar cane even though it had been used for grazing for many years. It is known that cane was grown there by Kanaka labour some 65 years before the Bureau acquired it, but cane production was abandoned about 25 years later. The remains of old cane drills, six to eight feet apart, were visible in the grassland, and some irrigation ditches still remained from the earlier sugar-growing period. It was during the filling in of one of those ditches that the workers unearthed parts of an old steam engine, boiler, etc., and pieces of an old cable plough.

It was not until 1954 that the Station was officially opened. In June of that year, the Chairman of the Sugar Experiment Stations Board (the Hon. H.H. Collins) "opened" the Station, a Field Day having been arranged for the occasion. The other members of the Sugar Experiment Stations Board (Messrs. A.F. Bell, J.W. Inverarity and L.G. Scotney) were present.

It was an unusual circumstance that three past-Directors of the Bureau (H.W. Kerr, A.F. Bell and E.R. Behne) were there as well as the then Director, N.J. King. The Chairman dropped the clanger of the day when, during his address, he referred to the presence of four past Directors. After all, there are more tactful ways of getting rid of a Director than sacking him publicly at a Field Day.

The Station property was found to possess a wide scattering of nut-grass, some of it relatively thick and some only a light infestation.

It was a considered opinion at the time that an Experiment Station had to contend with sufficient interfering factors which militated against experimental precision without having the additional scourge of nut-grass. It was decided therefore to accept the high cost of clearing the property by means of methyl bromide fumigation. This was done, and the nut-grass-free situation is maintained to this day.

The irrigation water is conveyed around the Station by underground mains and, in recent years gated fluming has been installed partly to eliminate open water-carriers and partly to provide a better degree of regulation of water flow to each furrow.

There have been many problems with both irrigation and soil. Early grading on some blocks produced growth irregularities where too much was taken off high spots. And the Bureau has encountered the problem, not unknown in the Lower Burdekin, of poor infiltration rate due to a peculiar soil-particle-size situation. The usual soil ameliorants, lime and gypsum, have not performed satisfactorily and, currently, the best results are given by bagasse and rice hulls.

The Bureau's only lysimeter is on this Station, and it has produced a lot of interesting information since its installation.

As at other Stations, a glasshouse was erected in 1952 for seedling raising. It was the first of the new pre-fabricated type imported by the Bureau, and it has demonstrated its suitability for the local conditions, although provision must be made for some temperature and humidity control in the Lower Burdekin environment.

Due to its relative youth, the Lower Burdekin Station has experienced little change in management since its establishment.

G.A. Christie            1950 to 1964

C.A. Rehbein            1964 to date

There is more than adequate acreage on this Station for essential requirements at the present time. This fortunate position allowed, in recent years, the extension of the grounds adjacent to the office building, by converting a small cane block into lawn area. Provision of such areas on experiment stations - partly for beautification and partly for such occasions as Field Days - is very desirable. Bundaberg and Mackay also

possess such areas, and it is to be regretted that scarcity of land at Meringa has resulted in such crowding of buildings and lack of "park" area.

The Lower Burdekin Station was developed in a period of post-war shortages. It is difficult to appreciate to-day that the Bureau was advised there would be a two-year delay in obtaining the electric motor for the irrigation pump; that fencing had to be carried out with aluminium barbed wire, which stretched when a beast leaned against it, because ordinary barbed wire was unobtainable; that many years of leaks in the underground, concrete irrigation mains resulted from cement shortage and the contractor's poor quality mortar.

Tully Experiment Station

"Tall oaks from little acorns grow". This might well be inscribed on the entrance gate to this "station in the making".

During 1965 the Board's attention was drawn to the plans for re-aligning the Moresby-Innisfail road, and it was pointed out that Ghietti, the farmer who made available the land for the Bureau's seedling sub-station at Mourilyan, would probably lose some assigned acreage and may not be able to continue the sub-station arrangement.

This information started the ball rolling, and the Director was instructed to initiate enquiries into alternative sites. Most Board members favoured the purchase of land so that there would be security of tenure. The local Bureau staff, Mr. Buzacott and Mr. McAvoy (Queensland Cane Growers' Council Chairman, resident in Goondi area) were asked to assist in the search. At about the same time the suggestion was made at Board level that, if the Bureau were to acquire more land, it should keep in mind the purchase of a parcel of suitable size for development of a "wet-belt" experiment station if such became desirable in the future.

The local search, including the help of Forestry and Lands Department personnel who could advise on Crown land, led nowhere except to the realization that the Innisfail area did not possess the unassigned land the Bureau wanted or - if it did (as in the case of Riordan) - it was not available for purchase.

The Director then proposed that the search be extended to Tully, and it was only a short time before an attractive proposal was forthcoming. Mr. Peter Borgna - Chairman of Directors of Tully Mill, and a hard-working, practical farmer - wrote to the Director on July 11th, 1968. His proposal was that the Bureau might acquire portion (100 acres was suggested) of a 640 acre water and camping reserve. This was located four miles south of the mill, 1.4 miles off the Bruce Highway, with Banyan Creek as a western boundary.

Inspection by our Innisfail and Ingham staff confirmed the land as very suitable for Bureau requirements, being part dense rain forest, part light forest and part open grassland. It was described by one of the staff as superior to any other non-assigned land in the Tully district.

On August 26th, 1968 the Director visited Tully and, together with the Manager and Chairman of Directors, met the Chairman and Shire Clerk of the Cardwell Shire. Subsequently, on September 4th, a formal request went to the Shire Clerk for the release and excision of a specified 100 acres of the reserve.

The reserve was, of course, Crown land vested in the Cardwell Shire Council. The only action needed from the Council was to agree to the release of the area and to recommend accordingly to the Land Administration Commission, which it did in October, 1968. The following month the Commission advised that it would be prepared to seek Executive Authority for the excision, providing the Bureau paid the costs of the necessary survey.

The Bureau arranged this survey which was completed in May, 1969. The final area worked out at 99 acres. Bureau staff conducted a contour survey and a soil survey of the site.

It was decided in September, 1969 to clear some 50 acres - part rain forest and part forest - and this was completed in October, by contract. Subsequent work involved Innisfail and Ingham staff personnel, as well as an enthusiastic group of Tully growers. Ripping, root-picking, raking, levelling, ploughing and general preparation of the area for planting were all carried out effectively and efficiently; but it all took time.

Planting of 20 acres was carried out in late September, 1970 and, when harvest was completed in early October, 1971, the crop aggregated 788 tons, 480 tons of which were sold for early planting.

The Central Sugar Cane Prices Board approved a Bureau application for an assignment of 80 acres on the Station. As in the case of other Experiment Stations, there is no attached peak. Sugar made from Experiment Station cane is additional to the sugar peak of the mill to which it is delivered.

As mentioned earlier Banyan Creek forms the western boundary, and it is along this western section that the rain forest exists. It is a very heavy, vine-type forest, typical of the "scrub" growth which originally clothed much of the Tully district.

For obvious reasons, the scrub should never be cleared to the creek bank but, for reasons of conservation, the Bureau should ensure that an appreciable area of this growth should be retained in perpetuity.

This property was acquired, and is being developed, for specific reasons. It is to provide for seedling selection and testing in the super-wet belt, and it will allow ample space for agronomic investigations of wet-belt problems. There is no great urgency - in the eyes of the present - for crash development. A resident officer can, pro tem, supervise the Station and act as district field man. Development will be at a steady rate, and will doubtless be planned and implemented according to the changing situation, and the demands then current.

It was mentioned above that the Station is bounded on the west by Banyan Creek, and this is the principal topographical feature of the locality.

The name was given to the creek by the botanist John Dallachy, a collector for the Melbourne Botanic Gardens, who joined the Dalrymple expedition in 1864. He named the creek Banyan because trees growing along its banks reminded him of the banyan trees he had seen in Ceylon.

The Smaller Centres

Prior to the establishment and development of some of the Experiment Stations, it was realized that a Bureau field service was necessary in certain areas remote from Experiment Stations. The first area so served was the Lower Burdekin where A.P. Gibson functioned for some years in an advisory and experimental capacity. That situation changed, of course, when an Experiment Station was established.

However, it became Bureau policy to appoint resident advisory officers to all areas where it was thought an adequate service could not be supplied from an Experiment Station. It must be acknowledged that local pressures accelerated these appointments in some cases.

The present chain of Bureau centres includes :-

- Mossman - started 1967, supervised by Tilley.
- Innisfail - started 1957, successively supervised by Knust, Skinner and Stewart; present staff three.
- Ingham - started 1954, Officer in Charge Myatt; present staff three.
- Proserpine - started 1966, Matthews in charge.
- Childers - started 1960, operated successively by Anderson, Stewart, Jones.
- Maryborough - started 1964, in charge, successively, Christie and Wright.
- Nambour - started 1946, and operated in turn by Smith, Rehbein, Toohey and Linedale.

In each case a residence was bought or built, and office accommodation obtained.

The coverage of the industry's 51 mill areas is now quite satisfactory. But the cane growers in some areas do not necessarily think so. There has been some pressure in recent years for the appointment of resident officers in Babinda, Tully and Rocky Point. The Babinda request has been countered on several occasions by the statement that Babinda is sufficiently close to Meringa to be adequately served from there. The Tully proposal has been met by the developmental work performed on a new Experiment Station. But Rocky Point remains as a problem; a small one, but still existent. The area is too small to justify a resident staff man; but it is too far from Nambour - nearly 100 miles - to ensure a day-by-day

service. Currently, the Bureau pays two-fifths of the Pest Board supervisor's salary and running expenses in return for (theoretically) two-fifths of his time on Bureau work. And the Nambour officer spends about one-sixth of his working days at Rocky Point - a week at a time.

The Bureau as a Training Ground

For forty years comment has been made on the migration of Bureau staff (principally from the mill technology division) into other branches of the sugar industry. The movement was mainly into sugar mill administration. Although such appointments were not looked upon too enthusiastically by Bureau administrators, they were a pleasing acknowledgement of the training and experience and calibre of the men the Bureau was losing.

Among the principal losses were :-

N. Bennett to Manager, Racecourse Mill

E.R. Behne to Manager, Inkerman Mill and, later, Managing Director,  
Pioneer Sugar Mills.

J.L. Clayton to Chemist, Cane Prices Board

C.B. Venton to Chief Chemist, Farleigh Mill and, later, Manager, Babinda  
Mill and Manager, Inkerman Mill

L.R. Brain to Manager, Invicta Mill

R. Deicke to General Manager, Fairymead Mill

G.A. Anderson to Production Superintendent, Inkerman Mill and later to  
Manager, South Johnstone Mill

G.H. Jenkins to private industry and later to University of Queensland

B.G. Adkins to Commonwealth Patents Office

A.H. Praeger to private industry.

There were many others who entered other industries from this division and one, E.D. Jensen, was elected to the Queensland parliament.

The losses were not confined entirely to mill technology. Generally speaking the Bureau has not lost a lot of long-experienced men from the agricultural divisions, but some of the more recent ones are worthy of mention.

Dr. H.W. Kerr to private industry and, later, as Director of Sugar  
Research Institute

A.F. Bell to Under Secretary, Department of Agriculture and Stock

W.A. McDougall to Department of Agriculture and Stock

C.R. von Stieglitz to Agricultural Chemist

W.J.S. Sloan to Department of Agriculture and Stock

G.C. Bieske to Fairymead Sugar Company

N. McD. Smith to Gibson and Howes, Bingera Plantation

J.R. Burge to Austral Pacific

A few became cane growers including E.V. Humphry, J.T. Elliott, G. Whitaker, P. Arnold and L.E. Rodman.

Some others; who were one-time members of the staff, attained some prominence in other fields :-

W. Cottrell-Dormer became Director of Agriculture in Tonga and later Deputy Director of Agriculture in New Guinea.

A.R. Henry, the Bureau's first Secretary, became Secretary of the Cane Prices Board.

L.M. Littlemore became Chief Research Chemist, Millaquin.

C.H. O'Brien became Chemist Member, Cane Prices Board.

J.R. Winders became Deputy Chairman of the Sugar Board.

Overseas Training, Commissions and Experience

It was in the 1920's that Kerr, Bell and Bennett were awarded overseas scholarships for advanced study purposes. Since that time the Bureau has not engaged too often in similar exercises. In 1949 J.C. Skinner was sent to Manchester University to enter a Ph.D. course of study in genetics and, in 1970 M. Berding was given leave of absence and assisted financially in a similar Ph.D. course in California.

The Bureau, or its administering body, has sent a considerable number of staff officers overseas (quite apart from conference attendance) to gain experience and/or to investigate specific matters. These included :-

E.J. Barke - 1932	To Java
R.W. Mungomery - 1934	To Hawaii
E.R. Behne - 1945	To U.S.A., Cuba and Hawaii
J.L. Clayton - 1948	To Hawaii
L.G. Vallance - 1948	To Ceylon, Egypt, England, West Indies and U.S.A.
D.R.L. Steindl - 1953	To California and British West Indies
L.R. Brain - 1954	To South Africa and Mauritius
J.H. Buzacott - 1955	To Philippines, India, Mauritius and South Africa
C.G. Hughes - 1955	To England, Europe, Canada and U.S.A.
Vallance and Leverington - 1961	To Hawaii
O.W. Sturgess - 1965	To Fiji, Jamaica, U.S.A.
K.C. Leverington - 1968	To U.S.A., United Kingdom, Holland, South Africa and Rhodesia.

Under the heading of "commissions" are listed the instances when staff officers received, and acceded to, requests from other countries to give expert assistance. In such cases, the Bureau officer obtained leave of absence and was thus enabled to accept the commission. Such engagements included :-

N.J. King - 1956	Philippines
- 1970	Puerto Rico
B.T. Egan - 1961	Colombo
C.G. Hughes - 1964	Venezuela
C.G. Story - 1965	Malaysia
J.C. Skinner - 1967	Mexico.

The Bureau Levy

The original Act of 1900 specified "The Minister may, in each year, make and levy an assessment not exceeding one penny on every ton of sugar cane received at a sugar works."

To-day the comparable section of the Act reads "Upon the recommendation of the Board the Minister may levy an assessment on every ton of sugar cane received ..... " etc.

These changes in wording give the Board the power to recommend the magnitude of the levy, and also remove the limit of that magnitude.

During the course of Bureau history the extent of the proclaimed levy has been :-

1901 - 05	One penny
1905 - 09	Nil
1909 - 17	One halfpenny
1917 - 18	Three farthings
1918 - 20	One halfpenny
1920 - 25	One penny
1925 - 26	One halfpenny
1926 - 27	One farthing
1927 - 28	One halfpenny
1928 - 29	Three farthings
1929 - 50	One penny
1950 - 55	One halfpenny
1955 - 57	One penny
1937 - 42	Three farthings
1942 - 45	One halfpenny
1945 - 46	Three farthings
1946 - 48	One penny
1948 - 50	Two pence
1950 - 51	Two pence
1951 - 52	Three pence
1952 - 53	Four and a half pence
1953 - 55	Four pence
1955 - 57	Three pence

1957 - 58	Four and a half pence
1958 - 60	Five pence
1960 - 61	Five and a half pence
1961 - 62	Six pence
1962 - 66	Five and a half cents
1966 - 69	Four and a half cents
1969 - 70	Five cents
1970 - 71	Five and three-fifths cents
1971 - 72	Seven and one-fifth cents

There are some milestones in this table. Firstly, the levy never exceeded one penny up until 1948; that year marked an enlargement of staff and activities in the immediate post-war years, and the beginning of the inflationary trend which had been absent since the depression years of the early 1930's. Secondly, there was a period, 1960 to 1969, when the levy appeared to stabilize at approximately four and a half cents per ton. And thirdly, there were two jumps in 1970 and 1971, the latter causing some agitation in industry organizations.

It has frequently been said by industry leaders that they had never complained regarding the magnitude of the Bureau levy. But the situation has changed recently. It must be kept in mind that the manufacturing side of the industry, besides providing half of the Bureau assessment, supports the Sugar Research Institute, spends very heavily on its own research in some cases (C.S.R., Kalamia, Pleystowe and other proprietary mills) and contributes half of the requirements of Cane Pest and Disease Control Boards. There is a limit to how much an industry is prepared to spend on technical research and service.

There are some fixed charges which are not controllable by the administration - such as salaries and wages - so any savings or economies must be related to the remainder of the costs. It is of interest to record that, for the 1970-71 Bureau expenditure, aggregating \$998,315, the salary and wages component was \$755,670, or 76 per cent of the total.

The Bureau may justifiably point to some of its outstanding performances which have far exceeded, economically, the investment by the industry in the Bureau. But some sectors of industry must be excused

for being a little myopic when considering the extent of the levy. To many of them it means a reduced payment per ton of cane, which aggravates an already difficult financial position in certain years.

It may be unpalatable, but none the less true, that if we had stabilised production and stabilised levy and a continuation of salary and wage rises, there would be progressively less money for new appointments and for maintenance of existing facilities.

It was with some of these facts in mind that a deputation from the sugar organizations met the Premier in December, 1971 with a request that the Government substantially increase its contribution to the funds of the Sugar Experiment Stations Board. The Government contribution is limited, under the Act, (and has been since 1955) to \$14,000 per annum.

Bureau of Sugar Experiment Stations Buildings

Building costs have varied so much during decades of inflation that comparisons mean very little. However, as a record, the following are the building costs of many of the Bureau properties. Building prior to 1939 is not included.

1939	Residence, Bundaberg Station	£ 1,250
1950	Residence, Ayr Station	£ 4,041
1952	Office, Ayr Station	£ 3,714
1953	Residence, Ingham	£ 3,565
1956	Office/laboratory, Mackay Station	£ 16,466
1958	Head Office, Brisbane	£103,671
1962	Office/laboratory, Meringa Station	£ 22,839
1964	Field Officer's residence, Ayr	£ 7,070
1965	House, Pathology Farm, Brisbane	\$ 7,130
1966	Field Officer's Residence, Proserpine	\$ 14,447
1966	Extension, Office/laboratory, Ayr	\$ 5,167
1969	Office building, Meringa	\$ 87,818
1970	Residence, Innisfail	\$ 22,620
1970	Extension, Office/laboratory, Mackay	\$ 57,000
1970	Office/laboratory, Pathology Farm	\$ 16,884
1971	Office/laboratory, Bundaberg Station	\$ 98,000

There are seven field officers' houses in various towns which were purchased "as was", but those are not included above.

### Cane Pest and Disease Control Boards

Brief reference has been made earlier in these notes to Cane Pest Boards, and Disease Control Boards. This is not loose terminology; and it is desirable to record the relationship between these, and the manner in which they led to the constitution of Cane Pest and Disease Control Boards - as we know them to-day.

The early history of pest destruction in our sugar industry is lost in obscurity; but, for a considerable period of years prior to 1925, districts could form voluntary committees which could collect subscriptions from cane growers. Such subscriptions were subsidized out of the Sugar Fund at the rate of 10/- in the £. (Note : The Sugar Fund was the official name of the Bureau monies, consisting of the miller-plus-grower levy, and the Government subsidy.)

The earliest record unearthed is in 1910 when, in Mackay, 22 tons of beetles were purchased by receivers. That is a lot of beetles!

In the year 1922-23 these voluntary committees operated at Cassowary, Isis, Mossman, Ripple Creek, Gairloch, Lannercost, Mourilyan, Stone River, Goondi, Mackay, Plane Creek, South Johnstone, Hawkins Creek, Macknade and Proserpine.

Then, in 1923, came the first pest control legislation under our Act. This empowered the Minister to constitute Cane Pest Boards - the legislation being inspired by Mackay growers. Such Boards were not compulsory, and many of the older voluntary committees continued to function. As late as 1927 some committees were still operating on subscription and, in addition, there were such organizations as the Halifax Planters Club, the Fairford Beetle Board, and the Miallo Rat Pest Destruction Board. But, in the same year there were also some of the new Cane Pest Boards at Mackay, Plane Creek, Lower Burdekin, Tully and South Johnstone. These new Boards were constituted for control of only beetles, grubs, rats, grasshoppers and weevil borers.

It is worth mentioning here that, at the time when the Sugar Fund was subsidising the local pest committees, its maximum levy was 1d. per ton of cane, and cane was worth only 10/- to 12/- per ton. With the 1923 legislation to constitute Cane Pest Boards the subsidy system was terminated.

It was not until 1938 that provision was made for Disease Control Boards. The amending legislation of that year provided for Cane Disease Control Boards and this legislation was sponsored by the Bundaberg Cane Growers' Executive. It will be recalled that the Fiji and downy mildew disease problems were the prime reason for the constitution of those Boards.

The complication then arose that certain districts had both Pest Boards and Disease Boards each operating independently and collecting separate levies. In fact, by 1941 there were twelve Pest Boards and eight Disease Boards in the State, so a further amendment to the Act combined these into Cane Pest and Disease Control Boards.

Since that year the whole of the sugar industry lands have been covered by such bodies, and to-day there are 18 compulsory Cane Pest and Disease Control Boards plus three voluntary Boards operating in the 31 mill areas.

It may be puzzling to some younger members of the Bureau staff why those three areas - Goondi, Mourilyan and Macknade - can continue under the voluntary system, while the other 18 have their operations governed by powers and duties laid down by the Minister.

To explain this situation, it is necessary to refer back to the 1923 amending legislation, and to realise that the formation of Boards was not compulsory. Then came the 1941 amendment which combined pest and disease control activities. Again there was no compulsion, but many districts decided to align themselves with the legislative procedures. However, some stood out and, as would be expected, the four mill areas controlled by the C.S.R. Company retained their voluntary organizations. Mourilyan did the same; why Mourilyan did this is not clear. But the Bureau has had the power, and has used it on occasions, to insist on the creation of Cane Pest and Disease Control Boards where it considered that the local circumstances warranted some action. On the other hand, the Bureau has been prepared to "go along with" a voluntary Board provided it was performing its function, at an acceptable standard, in disease and pest control in its area. Some examples can be quoted in this context.

In November, 1952, Mungomery who was then O/C Entomology and Pathology recommended to the Director that the Babinda area be declared cane pest and disease infested, and that a Cane Pest and Disease Control Board be constituted because of the complete lack of control measures in that mill area. At that time Babinda was the sole sugar district which had neither a compulsory nor a voluntary Board. This recommendation was approved by our Board in the same month. A Government Gazette notice declared the area disease and pest infested on December 13th, and the Babinda Board was constituted by Order in Council on December 20th. The election for the personnel of the first Board was held in March, 1953. This was quick work, but it was believed that an emergency situation existed, and that the Babinda growers would not initiate a movement on their own.

Soon after the passage of the 1941 Amendment Act, providing for the establishment of combined Cane Pest and Disease Control Boards, the Victoria mill area was proclaimed cane pest and disease infested, and a compulsory board constituted. This move was not accepted too kindly, but it was rendered necessary by the disease situation in the area. Not long afterwards the then manager of the neighbouring mill area - Macknade - asked the writer if a similar action was intended in the Macknade district. The reply was "So long as the pest and disease situation is handled adequately by the voluntary board, there will be no reason to constitute a compulsory one." That position still exists.

Another instance was the establishment by the Bureau of a compulsory board in the Hambledon area. The voluntary one was, in the opinion of the Bureau, not functioning adequately. Some growers would not contribute to the voluntary body and the control of gumming disease was being hampered. By insisting on a compulsory board the Bureau had the power to deal with outbreaks of the disease.

The Bureau's reasoning in planning the necessary Act amendments for disease and pest control was aimed at establishing the modus operandi. The Bureau had neither the staff nor the funds to do this industry-wide job itself; nor was it practicable, within the limits imposed by Government control of levy and of subsidy, to increase its income sufficiently

to employ all the extra inspectors which would be required. The writer recalls the Director of the time, Arthur Bell, saying on one occasion "All of this pest and disease control work should have been taken on by the Bureau. To-day there is a situation of some inspectors and board members being sub-standard, and a complete lack of uniformity in tackling the job." The Bureau therefore - with reluctance and misgivings - planned the chain of Boards which, at least in theory, would carry out the Bureau's policy in pest and disease control matters. The Boards were to be, in practice, an extension arm of the Bureau.

But they did not often work in that way. Board membership which, in the earlier years, was not greatly sought after, grew into a job with some district prestige. Some Boards did not bother to invite the local Bureau officer to attend meetings in an advisory capacity. There were even cases where Boards resented Bureau "interference".

In 1970-71 the Sugar Experiment Stations Board discussed at length a proposal that the Sugar Experiment Stations Act be amended to provide a sixth member on each compulsory Board - a local Bureau officer - with voting powers on all matters concerning pest and disease control. The Chairman was agreeable to an Act amendment, but desired to obtain in advance the concurrence of the three sugar organizations. On submission of the proposal to the executives of those organizations the resulting opinions were :-

Proprietary Sugar Millers' Association : The proposal does not go far enough. The Bureau officer should be Chairman of the Board.

Australian Sugar Producers' Association : Agree, providing the Bureau member does not have voting rights on purely domestic matters.

Queensland Cane Growers' Council : Did not agree.

It was decided by the Sugar Experiment Stations Board not to proceed further unless the Queensland Cane Growers' Council withdrew its opposition.

The writer is fearful that, as time goes on, some Cane Pest and Disease Control Boards may attempt to become even more autonomous. Even now, instead of carrying out Bureau policy, some are tending to direct the Bureau (or attempting to do so). And several are demonstrating increasing resentment at staff salaries and conditions, and Board members fees, being subject to Ministerial approval, on the recommendation of the Sugar Experiment Stations Board.

The I.S.S.C.T.

This has nothing to do with Bureau history; but Bureau contributions to and attendance at, Congresses is relevant to Bureau activities.

Although the numbering of Congresses dates from the 1924 meeting in Hawaii, this was not strictly an I.S.S.C.T. meeting.

In August, 1924 there was convened in Honolulu the First Pan-Pacific Food Conservation Conference. There was a sugar section in the programme, and that section arranged several sectional meetings. There were no prepared papers - only group discussions.

The representation, country by country, was :-

Australia	-	Barnett, Freeman and North - all C.S.R.
Fiji	-	Clarke - C.S.R.
U.S.A.	-	Brandes, Cockerill, Marlatt, Osborn (only Brandes was a sugar man).
Cuba	-	Calvino, Wood.
Formosa	-	Ishida, Oshima.
Philippines	-	Atherton Lee, Pendleton.
Puerto Rico	-	Kay.
Hawaii	-	A group of 29.

It was decided at that meeting to form the I.S.S.C.T., to hold triennial congresses, and to convene the 2nd meeting at Cuba in 1927.

At subsequent Congresses, the Bureau was represented as follows :

1927	Cuba	Bennett
1929	Java	Easterby and Bennett
1932	Puerto Rico	Bell
1935	Queensland	Various
1938	Louisiana	King (as Q.S.S.C.T. delegate)
1950	Queensland	Various
1953	British West Indies	King and Venton
1956	India	King and Nicklin
1959	Hawaii	Mungomery and Adkins
1962	Mauritius	Hughes and Bieske. Story as Q.S.S.C.T. delegate
1965	Puerto Rico	King, Myatt and Claire. Egan as Q.S.S.C.T. delegate

1968	Taiwan	King, Atherton and Wilson. Egan and Hogarth privately
1971	Louisiana	Sturgess, P. Stewart and J. Skinner. Egan privately.

On occasions the Sugar Experiment Stations Board has been represented at these Congresses.

In 1956 J.W. Inverarity and L.G. Scotney were delegates,

In 1959 Dr. Summerville attended,

In 1968 E.C. Row represented the Board, and

In 1971 J.H. Webster was a delegate.