

BACKGROUND TO THE CENSUS

On the 20th December 1968, the Executive Council authorised the Government Statistician, Mr. Calvin Smith, to undertake the preparatory work for the Decennial Census and to determine the feasibility of taking the Census in October 1970.

Ideally, a country requires at least 3 years in which to prepare for the taking of a Census. Such preparation involves developing a questionnaire, providing maps and other materials necessary for the enumeration, conducting a publicity campaign, setting up a programme for processing the thousands of completed Census documents and last, but by no means least, recruiting and training staff in the work they will have to carry out. There was considerable concern therefore that the 1970 deadline should be met and that the loss in continuity which would result from a postponement until 1971, should be avoided.

It was clear at the outset that the 1970 deadline could be met only if we could utilize the preparatory work of other countries. Accordingly, the Statistician examined Census questionnaires for Canada, the United Kingdom, United States and the Commonwealth Caribbean.

This investigation revealed that the questionnaires of the larger English speaking countries would be unsuitable:-

- (i) They were very complex and would involve considerable resources in training interviewers and familiarizing the public.
- (ii) The development of the questionnaires was too advanced to permit the kind of modification required to take into account needs peculiar to Bermuda.

Hence the Statistical Bureaux of the larger territories all advised that we join forces with the Caribbean.

The Governments of the Commonwealth Caribbean, Guyana and the University of the West Indies had been developing a common Census questionnaire since early in 1967. The special Census Coordinating Committee was chaired by Dr. George Roberts who had also been Chief Census Officer of the defunct West Indies Federation.

Two features of the programme were of vital importance: (i) the questionnaire was to be mark-sensed, and (ii) the tabulation would be carried out on an I.B.M. 360-30 computer donated by the Government of Canada to the University of West Indies for the 1970 Census programme.

Mark-sensing is a process whereby entries on the Census document are read directly into the computer, thereby eliminating the need for the intermediate step of transcription. This innovation greatly reduces the time necessary for inputting data while virtually eliminating a major secondary source of error. The advantage of processing the Census returns by computer, particularly one with the capacity of the 360-30 was simply that greater sophistication would be possible in the tabulation procedures.

There were other important benefits. The Caribbean Census programme would make available considerable technical expertise for training enumerators, planning the local programme and analysing the results. Further, since the Caribbean questionnaire had not been finalized it would be possible to include questions to meet needs specific to Bermuda.

These findings were conveyed to Executive Council which on the 14th October, 1969 instructed that:

1. the National Census of Population be taken on Sunday, 25th October, 1970;
2. a Census Committee be appointed to comprise:
 - (a) Member for Immigration & Labour (Chairman)
 - (b) Member for Finance
 - (c) Member for Health & Welfare
 - (d) Member for Education
 - (e) Member for Planning
 - (f) Member for Organisation
 - (g) Member for Youth Services
3. the Government Statistician be appointed Superintendent of Census;
4. the Secretary to Executive Council be asked to arrange as soon as possible for the secondment of a suitable officer to be Census Organiser in Grade IV or V;
5. the Attorney General be requested to draft the necessary Census Order and Census Regulations; and
6. the Government Statistician be authorised to consult the Department of Statistics of the Jamaican Government, the Regional Census Adviser of the Conference of Commonwealth Caribbean Statisticians and suitable computer service bureaux on the design and tabulation of the Census questionnaire.

Subsequently, the Statistician visited the Commonwealth Caribbean Census Coordinating Committee in Jamaica to determine:

1. under what conditions Bermuda could become involved in the joint Census exercise being undertaken by the Caribbean countries;
2. to what extent the questionnaire could be modified to reflect Bermuda's particular needs;
3. what arrangements could be made for processing; and
4. when Bermuda would receive an agreed set of tabulations.

The condition for joining the group was simply payment of a total fee of U.S. \$20,000.00 over three years. In return for this

we obtained a questionnaire, technical advice for conducting the Census, access to training materials, and programming and tabulating facilities.

The Committee emphasized that few modifications were possible since the advantages gained through the joint effort would disappear if changes were permitted on a wide scale. Eventually, it was agreed to include questions on Bermuda Status, Subsidiary Occupations and Rent, and to modify significantly questions on the section on Housing. (See questionnaire, Appendix 1).

Processing arrangements were as follows: Bermuda would conduct a preliminary edit of the completed returns which would be submitted to the Computer Centre where the documents would be "machine-read" and acceptable documents transferred to a computer master file. The rejected documents would be edited and processed again. Subsequently a "clean" master file of all Census documents would be completed and the tabulations would commence.

The tabulations were to be in three phases:

1. The Enumeration District Listing

These tabulations consisted of the basic characteristics of males and females in the population, tabulated at the level of Census district. These were expected from eighteen to twenty-four months after the Caribbean Census taking (April 1970). These tabulations would make available information equivalent to that compiled for the 1960 Census.

2. The Cross Tabulations

These tabulations were much more complex involving the distribution of one or more characteristics of the population against another. For example, "Occupations" might be distributed by "sex" and "five-year age group". These were expected from twenty-four to thirty months after the Caribbean Census.

3. The Research Tabulations

These were special tabulations which would be required by research groups from Universities and Governments and would be carried out after phases one and two were completed.

The time allocation of two and one-half years budgeted for the completion of phases one and two turned out to be considerably more than had been anticipated locally. However, Bermuda was assured that if her questionnaires were received ahead of the larger islands, the Enumeration District Listings would be returned within twelve to eighteen months of the taking of the Bermuda Census, that is, between October 1971 and April 1972.

These assurances led the Census Committee to advise the Governor in Council to issue "The Census Order 1970" declaring that "A census shall be taken in these islands on Sunday, the 25th day of October, 1970". This Order was published in the Official Gazette on 28th March, 1970. Subsequently on 11th June, the Regulations under which the Census was to be conducted were passed by the House of Assembly. (See Appendix 2.)

PRE-ENUMERATION ACTIVITIES

Introduction

Preparations for the Census began in a practical sense with the secondment of a Census Organiser, Mr. G.R. Bassett, following the Executive Council Memorandum of 14th October, 1969 (Conclusion No. 42(69)6). Mr. Bassett, assisted by one clerk, Mr. Delwyn Joseph, proceeded to update the 1962 aerial survey maps of Bermuda, to designate Census Districts and to draft memoranda describing their boundaries.

This material - a map and description of the Census Districts - was an important part of the basic equipment of Enumerators.

The pre-enumeration activities may be viewed conveniently under the headings of organisation, recruitment and training, and publicity. Organisation refers to the delegation of powers and assignment of tasks necessary for the efficient carrying out of the Census. Recruitment and training involved the whole process of assembling staff and preparing them for this massive, complex, administrative exercise. Publicity relates to activities which had to be performed via mass communications media to ensure maximum cooperation of the general public.

Census Organisation

Creation of Administrative Areas - To facilitate the administration of the Census taking, the island was divided into Regions, Supervisory Units and Enumeration Districts. There were three regions designated as Eastern, Central and Western. Specifically, the Eastern Region included the 1970 political constituency of Devonshire South and the Parishes of Smith's, Hamilton and St. George's; the Central Region consisted of the 1970 political constituencies of Devonshire North and Paget East and the Parish of Pembroke; the Western Region included the 1970 political constituency of Paget West and the Parishes of Warwick, Southampton and Sandys.

Each Region was further divided into supervisory units which corresponded in all cases except two, to the political constituencies. Exceptions were Hamilton Parish East and West which were combined into one supervisory unit, and Pembroke West which was

divided into two supervisory units. Each supervisory unit contained several Census districts which ranged in number from seven in Southampton to fifteen each in Hamilton Parish, Devonshire South and Warwick West.

Further delineations were made to enumerate persons in hotels and foreign armed forces personnel residing on bases located in the island. Thus each hotel and the naval bases were designated as enumeration districts.

Census Administrative Structure - The geographical areas dictated the administrative structure. Thus a commissioner was responsible for the enumeration of a region, a census supervisor for a supervisory unit and an enumerator for a census district (also called enumeration district).

An organisational chart of the 1970 Census would look like this:

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          Census Committee
          Census Superintendent
          Census Organiser
Field Staff          Office Staff
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The Census Committee was responsible for the supervision of the Census Operation and for keeping Parliament informed of its progress. The Census Superintendent was responsible for the originating of policy, the organisation of the Census, liaison with the Caribbean Census Coordinating Committee and the general direction of the Census Programme. The Census Organiser was responsible for the coordination of the whole Census programme and the day-to-day management

and supervision of the office and field staffs.

The office staff consisted of typists and clerks whose responsibilities included the creation of Census maps, the assembly and distribution of supplies, the editing of census returns, as well as typing, filing and other office routines. Two to four persons were involved during the pre-enumeration and enumeration stages; however, this number rose to nine during the post-enumeration period.

The field staff consisted of Commissioners, Supervisors and Enumerators. Commissioners were primarily responsible for the enumeration of households in a region. This included liaison with head office staff as well as directing and coordinating the activities of supervisors. In addition, commissioners were responsible for recruiting enumerators, supervising training centres and the final selection of enumerators.

The supervisors were primarily responsible for the enumeration of households in a supervisory district. In addition they carried out the actual training of enumerators and advised on the final selection.

The enumerators carried out the actual house-to-house interviews. Their role was to ensure that all households were contacted and that a Census return was completed for each member of the household.

Administrative Personnel - The original Census Committee was chaired by the then Deputy Government Leader, the Hon. Sir Edward Richards. Other members of the original Census Committee included

the following Government Members:

The Hon. John H. Sharpe
 The Hon. Mrs. Gloria McPhee
 Dr. the Hon. E. Stanley D. Ratteray
 The Hon. C. Vail Zuill
 The Hon. John R. Plowman
 The Hon. Lancelot J. Swan

and the following civil servants:

The Census Superintendent, Mr. Calvin J.M. Smith
 The Census Organiser and Secretary to the Committee,
 Mr. G.R. Bassett
 The Director of Public Relations, Mr. D. Colin Selley.

Since all members were appointed ex officio, the Committee changed as persons changed office. Thus the Hon. C. Vail Zuill, Dr. the Hon. E.S.D. Ratteray and the Hon. Sir Edward Richards were replaced by The Hon. E.W.P. Vesey, The Hon. Q. Edness and The Hon. C.V. Woolridge while The Hon. John H. Sharpe, Deputy Premier, assumed the chairmanship. Messrs. G.R. Bassett and D.C. Selley were replaced by Messrs. Oliver Heyliger and A. Gavin Shorto.

The entire staff involved in carrying out the enumeration numbered 286. These included the Central staff (4), Commissioners (3), supervisors (20), enumerators (241), and special enumerators (18). The last named group were responsible for the enumeration of hotels and institutions and were reserves for the regular enumerators. The Census Supervisory staff and their areas of responsibility are listed below:

Census Superintendent - Mr. Calvin J.M. Smith
 Census Organiser - Mr. Gladstone R. Bassett

<u>COMMISSIONER</u>	<u>DISTRICT</u>
Mr. Harold E. Chudleigh	Eastern Region
Mr. Ivan C. Cunningham	Central Region
Mr. T. Neville Tatem	Western Region

<u>SUPERVISOR</u>	<u>CONSTITUENCY</u>	<u>NUMBER OF ENUMERATION DISTRICTS</u>
<u>EASTERN REGION</u>		
Mrs. Sylvia Shorto	St. George's North	11
Mr. Keith Forbes	St. George's South	11
Mr. Dudley Burchell	Hamilton East & West	15
Mr. Bertram Gulshard	Smith's South	9
Mrs. Jean Clifford	Smith's North	11
Mr. John Bento	Devonshire South	15
<u>CENTRAL REGION</u>		
Dr. Joseph Christopher	Devonshire North	10
Dr. Gerard Bean	Pembroke E. Central	14
Mr. Wentworth Christopher	Pembroke East	13
Mr. Oliver Heyliger	Pembroke W. Central	13
Mr. Robert Deslongrais	Pembroke West "A"	10
Mr. Denny Richardson	Pembroke West "B"	13
Mrs. Mary Smith	Paget East	11
<u>WESTERN REGION</u>		
Mr. Edward Crawford	Paget West	13
Mr. Arthur Lodge	Warwick East	14
Mr. Clevelyn Crichtlow	Warwick West	15
Mrs. Shirlee Smith	Southampton East	7
Mrs. Joan Solly	Southampton West	11
Miss Iris Davis	Sandys South	13
Mrs. Consuelo Williams	Sandys North	12

Recruitment and Training

Recruitment was in two stages. Stage One included recruitment and training of the Census Commissioners and Supervisors and Stage Two included recruitment and training of Enumerators.

Following the recruitment of the Commissioners and Supervisors, training sessions were held at Dellwood School from 1st to 14th August, under the direction of the Census Superintendent. During this period the Census supervisory staff were familiarised with the questionnaire and with interviewing techniques. Professor G.R. Roberts, Chairman of the Census Coordinating Committee visited

Bermuda during the following week and explained the more subtle aspects of the questionnaire.

Following this training period, the Commissioners and Supervisors conducted a pilot Census in the Pembroke area during which time some sixty-odd households were visited. This enabled the supervisory staff to become thoroughly familiar with the questionnaire and with interviewing techniques and provided advance knowledge of problems to be faced in the enumeration.

Upon completion of training, the Commissioners and Supervisors were employed in training the Enumerators. Three centres were used - Warwick Academy for the Western, the Berkeley Institute for the Central, and Whitney Institute for the Eastern Region. This final training period was completed in the third week of September and 260 Enumerators were almost ready for action.

Complete readiness involved learning the boundaries of the Enumeration Districts, and ensuring that the dwellings shown on the map corresponded with those actually on site. This phase required that Supervisors meet with Enumerators to point out the boundaries of their districts and that Enumerators check each dwelling to determine whether or not it was inhabited and/or habitable.

Publicity

It was decided to use the services of a private agency to carry out the publicity. Tenders were offered, bids received and the firm of Scott Crafts Ltd was ultimately selected. The Census Office worked in close cooperation with this firm from the date of its hiring

early in August 1970 until the end of its contract on Census Day, 25th October, 1970.

The publicity campaign, which was low-keyed and non-governmental, aimed at involving the total population. This aim was achieved by structuring the whole publicity effort around children and adopting the Census slogan "Help the people who count . . . and that means everybody". There were the usual press releases and television appearances and at all times the long-term benefits to the people - as symbolised by the children - were emphasized.

The tremendous cooperation received from the general public, despite an undeclared state of emergency, was a testimonial to the success of the campaign.

THE ENUMERATION

Organisation

In the main, the Census organisation was designed to enumerate persons in private households. However, such persons, though numerous, do not constitute the entire de facto population, hence it was necessary to make special arrangements to enumerate persons in institutions, group dwellings, hotels and those on ships and on the foreign bases located in Bermuda. As noted earlier, the island was divided into three regions - Eastern, Central and Western - with a Census Commissioner responsible for the supervision of the enumeration in each region. Assisting the Commissioners were twenty supervisors - seven each for the Western and Central regions and six for the Eastern region. These supervisors were responsible for 241 enumerators

distributed as follows: 85 in the Western region, 84 in the Central region and 72 in the Eastern region. The number of enumerators per supervisor ranged from 7 to 15 with the average being 12.

The work-load per enumerator averaged 67 households and 214 persons. However, the range of work-load varied substantially - from 23 to over 100 households and from 88 to over 500 persons.

Persons dwelling in institutions and those in group/dwellings were enumerated by 18 special enumerators who reported directly to the Commissioners. Visitors residing in hotels and guest houses were enumerated by the management. The enumeration of Armed Forces Personnel resident on bases was carried out in the main by the Armed Forces Personnel who conveyed information obtained directly to the Census Organiser. Information concerning persons on ships was obtained from shipping agents, while visiting naval personnel were enumerated by locally resident Commanding Officers.

Of the groups mentioned above, only those in group/dwellings were required to complete the entire questionnaire. All others answered the first ten questions only.

The Enumeration

The enumeration began on 1st October, 1970 at which time some 241 enumerators began visiting households seeking demographic, social and economic information required by the Government of Bermuda (Appendix 1). Although a document had to be completed for every member of a household, it was agreed that persons who were in full-time attendance at a school or university would not

be required to answer the section on Economic Activity. Similarly it was agreed that females under 16 years of age would not be required to answer the questions on fertility.

The response was excellent and by Census Day, 25th October, virtually the only persons not enumerated were those who had never been located or who were out of the country. Outright refusals were minimal.

Three more weeks were spent in the field, by the Supervisors and a few of the more experienced enumerators, clearing up the above categories of persons. When the enumeration was officially closed, the census staff could happily report no outright refusals, and only a few "not at homes" who were never located and who may have been disguised refusals.

The Remuneration

Payment for the enumeration was as follows:

Commissioners were paid \$90 weekly commencing September 1 and continuing until the middle of November. In addition, they received \$2.50 per session for 11 training sessions and \$10 per night for supervising the sessions for training enumerators.

Supervisors were paid the same rates as Commissioners for attending training sessions and for instructing enumerators, a \$60 retainer fee during the pre-enumeration periods and from \$300 to \$387.50 for the actual enumeration. These variations in rates reflected differences in the number of enumerators per supervisor.

It was agreed to pay enumerators \$2.50 for each training session attended, \$5 each for the pre-enumeration work and 65¢ for each completed questionnaire. This last provision turned out to be grossly inadequate in view of the great variation in work loads. Hence, it was agreed to increase the payment to each enumerator earning under \$100 by \$50 and to those earning between \$100 and \$150 by that amount which would bring their earnings up to \$150. Wages for those earning more than \$150 were unaltered.

Finally, it was agreed to pay each supervisor a bonus of \$50 and each commissioner a bonus of \$250 to compensate these personnel for work "over and beyond the call of duty" during the enumeration.

POST ENUMERATION

The post-enumeration phase covers the period immediately following the enumeration. It includes processing, evaluation, analysis and the dissemination of the results. Although we shall review these phases in the order listed, in practice they may occur either in sequence or simultaneously. What is important is that although two or three phases may be going on at once, usually only one is receiving the major emphasis at a particular time.

The analysis also attempts to explain the considerable time lag, which, it is now clear, resulted from undermanning professionally at both the University Computer Centre and at the Bermuda Census Office. Also related to the general problem of staffing was a lack of proper liaison with the Computer Centre. These issues will be explored in depth later.

Processing

Processing involved the preparation of the data for tabulation and the actual tabulation. Preparation of the data began in Bermuda and involved editing the completed returns for errors and omissions and coding. Training for this phase was provided in late November 1970 by Misses Merle Johnson and Sonja Sinclair from the University of the West Indies. Editing involved making certain that the document was properly marked, checking with respondents to obtain answers which were omitted or thought to be incorrect and correcting inconsistencies by the application of rules developed at the Computer Centre. Coding was required for only five questions which were religion, vocation for which trained, occupation, business of employer and subsidiary occupation.

Coding and editing began with a staff of seven under the supervision of the Census Organiser. This staff was eventually increased by two in order to extract information for a housing study requested by the Executive Council. Coding and editing was completed by April 1971 and despite the fact that Bermuda's Census was carried out six months after the rest of the islands participating, our documents were among the first complete sets sent to the Computer Centre. The Census Organiser conveyed the documents to Jamaica and remained there for three weeks while they were being processed.

At this point, the quality of the editing in Bermuda paid off - our data was read into the machine with one of the lowest initial rejection rates. The rejected documents were those containing at least one error, omission or inconsistency (e.g. male reporting,

pregnancy). The Census Organiser advised editing staffs at the university on how to correct our rejects. By the end of May, 1971, the computer file for Bermuda was "clean" and the data ready for tabulation.

Evaluation and Analysis

The commencement of tabulation introduced the evaluation and analysis phase. The first tabulations were received in October, 1971, after a special request for information needed by the Commission appointed to revise the Electoral Boundaries. These tabulations included the Armed Forces Personnel as required by the legislation dealing with Electoral Boundaries.

By January, 1972, the office had received some twenty tables including the age/sex distributions and the full set of housing tables. However, when these tabulations were evaluated, it was discovered, to the dismay of the Census Office, that the tabulations all included the Foreign Armed Forces personnel living off the bases. After emphasizing that these persons were to be included in the special exercise for the Boundaries Commission, the office neglected to ensure that they were excluded from subsequent tabulations. By the time this error was corrected the advantage gained from an early start had been lost as other islands were now demanding attention.

From January to April, 1972, several cross-tabulations on Economic Activity were received but were found to be internally inconsistent and therefore not in a condition for publication, though useful to knowledgeable persons. In May, Mr. G.K. Stanton, Mathematical Statistician, was assigned to the Census and began to resolve the inconsistencies. However, before he could complete his

investigation, he had to be transferred to other pressing problems.

Of first importance in the evaluation and analysis were two reports carried out by Dr. Dorothy Newman and Dr. George Roberts. Dr. Newman was employed in August, 1972, for a six week period to analyse the Census tabulations received up to that time. This work was completed in November, 1972, and provided important insights into the nature of the data we had received. The study by Dr. Roberts, which emanated from our agreement with the University, analysed the population growth over the decade and forecast population changes up to 1990.

Apart from the above mentioned reports, there was little involvement by the Census staff from August, 1972, to April, 1973, because of other commitments. But the tabulations continued to arrive so that by April, 1973, the outstanding tabulations included mainly the original twenty erroneous tabulations.

The Mathematical Statistician returned to the Census work in April, 1973, and by May had resolved the apparent inconsistencies in the tables on Economic Activity. Jamaica was revisited in June, 1973. Our explanation of the inconsistencies was discussed and accepted, and outstanding tabulations were obtained.

There then followed a rush to prepare the report for the printers. This phase was completed October 5, 1973 and the final report was received by the end of October, 1973.

Dissemination of Results

Although the official Census Report has not been made available

to the public until some three years and one month after Government had provided for the taking of the Census, four major reports from the Statistical Office and two equally important reports from the Departments of Planning and the Post Office have been based on Census results. The reports issuing from the Statistical Office have been the following:

- (i) "A Preliminary Housing Study" - Statistical Office, 1971. This report provided the analytical framework and the Statistical basis for Bermuda's current housing policy.
- (ii) "Adult Bermudians Aged 21 years or Greater on Census Day, October 25th, 1970" - Statistical Office, 1971. This report plus the provision of maps prepared for the Census enumeration provided the basis for the re-alignment of electoral boundaries.
- (iii) "Provisional Estimates of Population Movements in Bermuda" - Prof. Roberts of the University of the West Indies, Jamaica, November 1972 on behalf of the Statistical Office. This report is still under study by various Government departments.
- (iv) "Population Dynamics of Bermuda, a Decade of Change" - by Dr. D.K. Newman, Senior Research Advisor, Washington Centre for Metropolitan Studies, Washington, D.C. on behalf of the Statistical Office. This report is also under study by various Government departments.

Reports issuing from other government offices based on Census data have been:

- (i) "Which Way Bermuda" issued in mid-1972 by the Department of Planning.
- (ii) "Bermuda's Postal Zones" issued by the Post Office and based on the Census Enumeration Districts, maps and descriptions of districts.

Census results have also been used to estimate the size of the work-force during the recent study by the Bermuda International Businessmen's Association; census results were fundamental in estimating

income distribution and characteristics of households for the McDonald Tax Study; data on business establishments taken during the enumeration provided the basis of the "Establishment List" used to survey business establishments and enumerators maps and instructions were of first importance in carrying out the re-registration necessary after the institution of the revised electoral boundaries.

Problems

In the introduction, it was pointed out that the time lag in the publication of the full Census Report was due, in the main, to understaffing professionally both here and in the Caribbean. A major expected benefit from our Caribbean association was to be the pooling of expertise from the large developed territories of Jamaica, Guyana, Trinidad & Tobago and Barbados. It was believed that staffs from these offices would uncover defects in the tabulations, incorrect interpretation of concepts and inconsistencies in general. As it turned out, by mid-1972 Bermuda was from nine to eighteen months ahead of these territories in terms of tabulations received and when these territories did catch up we had struggled through the evaluation and analysis virtually unassisted.

Lacking the staff locally to deploy full-time on the Census and faced with the situation in the West Indies, the local office found that it could not come to grips with the technical problems involved. What was required was a sustained period of uninterrupted study, a condition reached by existing staffs for brief periods only.

The experience of the Census of Population has convinced the Statistical Office of the need for assigning an officer full-time to

all ad hoc surveys. It may be that in the future consideration should be given to importing the technical expertise required, so that on-going programmes will not be seriously hampered by the over-utilization of existing resources.

The Budget

Despite savings incurred through association with the islands

of the Commonwealth Caribbean, the Census was costly. The original appropriation of \$115,000.00 to cover the pre-enumeration, enumerating, editing and tabulation phases was increased by \$50,000.00 in 1971 to cover the cost of staff required for processing, analysis, the Newman Report, and the printing of statistical tables and reports. The final budgeted cost was therefore \$165,000.00.