# TWELFTH ANNUAL REPORT OF THE VICTORIAN CYTOLOGY (GYNÆCOLOGICAL) SERVICE FOR THE YEAR ENDING 30th JUNE, 1977.

In the twelve months covered by this report diagnostic activity has continued at a high level. A considerable proportion of the female population of Victoria has been screened on at least one occasion and this screening has yielded a large number of cases of cervical cancer, many of which were unsuspected clinically and in an early and potentially curable form.

## DIAGNOSTIC ACTIVITIES:

From July 1st, 1976 to June 30th, 1977, 228,692 smears were examined. This brings the total number of specimens examined since the inception of the Service in January, 1965, to 1,813,584. The number of smears examined in this financial year represents an increase of 10,630, or approximately 5 per cent., on that for the previous year.

Major abnormalities were detected in 804 women during the financial year under discussion, bringing the total number of major abnormalities detected since the inception of the Service to 5,972. These "major abnormalities" are cases of invasive or established cancer or those conditions which are believed to immediately precede the development of invasive carcinoma, namely severe dysplasia and carcinoma-in-situ. As in previous reports the figures refer to numbers of patients, not numbers of specimens, since a patient with an abnormality may have repeated smears for interpretation or confirmation of that abnormality.

## FINANCIAL ASPECTS:

The total operating expenditure of the Service for the year ending 30th June, 1977, was $562,509. Of this cost, salaries and wages absorbed $444,535 or 79 per cent. of the total. It should be noted that these amounts are cash figures, whereas in previous years, the figures given have been based on the accrual method of accounting. This change in method is in accordance with instructions from the Department of Health and the Treasury Department.

The total operating expenditure on a cash basis for the financial year was $79,981 more than for the previous year, an increase of 17 per cent. Salaries and wages increased $61,031 or 16 per cent., this being due to national wage increases and the appointment of three new staff members during the financial year.

The altered method of accounting prevents an exact comparison of costs per smear for the financial year under discussion with those of previous reports. However, the figures are reasonably comparable and hence the

The "service and materials cost" comprises all the costs of running the Service with the exception of salaries and wages, the latter being used to calculate the "salary cost per smear". Since the inception of the Service the average cost per smear has been $1.49 whilst, as indicated in the table, the cost per smear during the financial year under review was $2.46. This compares very favourably indeed with the current medical benefits schedule fee of $9.60 for the examination of a gynæcological smear for cancer cells. It compares even more favourably with the combined fee of $17.90 usually charged, the latter including $8.30 for hormonal assessment. The low cost achieved by the V.C.(G.)S. is a reflection of the very marked efficiency with which the Service operates. This efficiency is due, in part, to the benefits of "mass production" techniques that are applicable to this branch of laboratory medicine. Tribute must also be paid to the internal organization of the Service and to the enthusiasm and technical competence and efficiency of every staff member. It is difficult to quantify such attributes but some indication of the efficiency of the staff is shown in Table 2. In compiling this table efficiency is expressed as the average number of smears processed per staff member, this figure being derived by dividing the total number of smears processed, by the total number of technical and clerical staff members employed. It can be seen that, whereas in the first 18 months of operation the number of smears processed was the equivalent of 2,622 per staff member, in the most recent year it was 5,198 - an increased efficiency of almost 100 per cent.

It is also of considerable interest to calculate the cost of detecting each major abnormality as previously defined. The operating costs for the financial year just concluded was, as already stated, $562,509. During this period major abnormalities were detected in 811 women and hence the average cost per major abnormality detected was $694. Since the inception of the Service the average cost per major abnormality detected has been $453. As has been emphasized in previous reports, such figures compare more than favourably with the cost of treating a case of advanced malignancy and take no cognisance of the benefits of promoting regular medical examinations and the lessening of suffering and death amongst the women of Victoria.

In view of the demonstrable efficiency, economy and effectiveness of the Service the continuing financial restrictions are a matter of concern. The V.C.(G.)S. has very precise budget requirements and has no way of absorbing arbitrary budget cuts. It does not control its level of activity, the work being generated by the medical practitioners and the women of Victoria. Its activities are confined entirely to the interpretation of one type of specimen and it is already carrying out this interpretation with maximum efficiency. Financial restrictions have already impaired the

lead to a complete breakdown of the Service. Increasing numbers of smears are being referred to private laboratories thus increasing greatly the cost to the community.

It is believed that the only logical way of funding the Service is on a cost-per-smear basis. In this way financial support would be related directly to diagnostic activities. The level of support must also be realistic. At present the Commonwealth Government accepts a minimum cost of $8.20 per smear - the benefit component of the schedule fee for the basic examination. This fee component is far in excess of the current financial needs of the Service. However, it does represent a useful basis for reasonable financial support. The ability of the cytology service to perform the test for less than this cost is an indication of the efficiency and economy of its operation. Indeed, when the cost per test is far below this fee any attempt to further reduce financial support is patently illogical and unrealistic.

STAFF:

At June, 1977, the following technical and clerical staff was employed:

Technical Staff:

| | |
|---|---|
| Full-time | One (1) Assistant Director. |
| | Eleven (11) Cytotechnologists. |
| Part-time | Thirty (30) Cytotechnologists and Screeners. |

Clerical Staff:

| | |
|---|---|
| Full-time | Fifteen (15) Typists, Clerks and Key-Punch Operators. |
| Part-time | One (1) Typist/Clerk. |

The medical staffing remains stable comprising:

| | |
|---|---|
| Dr. Michael Drake (Director) | Quarter-time. |
| Dr. Gabriele Medley | Half-time. |
| Dr. Tang Siew Khin | Full-time. |

Dr. Drake and Dr. Medley also hold appointments within the Prince Henry's Hospital Department of Anatomical Pathology.

In June, 1977, Dr. Tang was elevated to Fellowship of the International Academy of Cytology. She had been a Member of this Academy since 1970.

Early in 1977 the Director, Dr. Michael Drake, was appointed a Member of the Executive Council of the International Academy of Cytology. In May, 1977, he attended the Sixth International Congress of Cytology, the triennial scientific meeting of the International Academy, and also the

Second International Conference on Automation of Cancer Cytology and Cell Image Analysis. Both meetings were held in Tokyo. During the congress Dr. Drake was appointed Executive Coordinator of the International Board of Delegates, a board established by the International Academy to facilitate communication between the Academy and the various countries with which it is affiliated. He was also appointed Chairman of the Terminology Committee - a scientific committee of the Academy established to devise a system of terminology, both histological and cytological, for cervical lesions that is acceptable to the majority of people practising in this field.

The Sixth International Congress of Cytology was also attended by the Assistant Director, Mr. Edgar Wilson. Subsequently Mr. Wilson visited a number of cytological centres in Canada and the United States of America to study laboratory organization and cervical mass screening programmes. He also inspected a number of computer installations and made specific enquiries regarding equipment suitable for use in the V.C.(G.)S.

ASSISTANCE FROM OTHER ORGANIZATIONS:

The Anti-Cancer Council of Victoria continues to promote the activities of the V.C.(G.)S. by way of its professional and public educational programmes. We are most grateful for this assistance.

The kits of materials sent to those medical practitioners who use the Service continue to be packed by members of the Floral Group of the Prince Henry's Hospital Auxiliaries. These workers spend many hours each week providing this most useful service and their help is deeply appreciated.

TEACHING AND EDUCATIONAL ACTIVITIES:

As in past years, senior staff members of the Service, in association with those of the Prince Henry's Hospital Cytology Department, have maintained an active teaching programme. The subjects Cytology I and Cytology II continue to be taught in collaboration with the Royal Melbourne Institute of Technology as part of the Diploma of Medical Technology of that Institute. In addition, 1977 saw the introduction of the subject Anatomical Pathology I, a component of the recently established degree course in applied science. The cytology section of this subject is also being taught within the laboratories of the Service.

In May, 1977, Miss Teresita Puhawan, a World Health Organization Fellow from the Philippines, commenced a six month course of training in the techniques of cytology.

CLERICAL ACTIVITIES OF SERVICE:

It has been apparent for some time that the clerical procedures, that have evolved since the inception of the Service, can no longer cope adequately with the increasing work load. In the twelve years that the Service has operated over one and three quarter million specimens have been examined, these specimens being derived from nearly one million women. It is essential that a record of each of these examinations be maintained. Approximately twenty-five thousand women have had a significant abnormality demonstrated this abnormality warranting some degree of observation or follow-up. As part of this follow-up it is essential that current cytology specimens be evaluated in the light of previous abnormalities demonstrated. This necessitates the maintenance of a card file of all women who have had a significant abnormality and all incoming request forms must be matched against this file. Since approximately 1,000 specimens are received each day this "abnormal file" search is extremely demanding of clerical staff time. The generation of reports is also a major activity. Although many of the reports are of a standard nature a great variety of reports is possible and the typing of such reports is cumbersome. Perhaps the greatest area of inefficiency relates to enquiries from doctors regarding their patients. If the enquiry relates to a smear despatched more than one month previously, it is likely that a record of the test will be within the current computer listing. However, most enquiries concern specimens despatched less than one month prior to the enquiry date. In this case the laboratory day-book or register of smears received must be searched and, since only an approximation of the relevant date is available, the search may be very extensive indeed. Even when the day-book entry is located, and the laboratory accession number of the specimen determined, the actual location of the smear within the processing system may be difficult. For these reasons an immediate answer to an enquiry is seldom possible unless the enquiry is urgent; in this event a detailed search is carried out this search causing a serious disruption of routine clerical activities.

Electronic data processing has always been utilized by the Service. However, because it has been necessary to use a commercial computer bureau, geographically remote from the Service, such E.D.P. activities have been confined to file replacement and a limited intermittent analysis of data. For these purposes key-punch machines have been operated on site, the punch cards thus generated being referred to the computer bureau. Changes in computer technology over recent years, including the development of mini-computers with powerful on-line capabilities, make it possible to upgrade the clerical

activities of the Service and overcome the many problems that currently exist. The installation of such equipment would increase enormously the efficiency of the Service and result immediately in moderate cost savings. Perhaps more importantly it would allow future expansion to occur without a complete breakdown of the already stressed clerical activities. The only alternative would appear to be a considerable increase in clerical staff numbers, a costly alternative and indeed an impracticable one in view of the limited space available.

Because of these factors a detailed study of the applications of current computer technology to the clerical problems of the Service has been carried out by the Assistant Director, Mr. E. Wilson, and a senior technologist, Mrs. Lourdes Brent. The requirements of the Service were specified in considerable detail and a number of computer systems were evaluated. This evaluation included visits to relevant installations both in Victoria and in North America. The latter visits were made by Mr. Wilson during his overseas trip referred to above.

These investigations suggest that the current relatively expensive and limited electronic data processing procedures should be replaced by an on-site mini computer which will maintain a registry of patients and specimens, facilitate file searching and the handling of enquiries, and provide data required for the issuing of reports. The reports could be produced by a high speed printer in post-code order ready for mailing. Follow-up procedures, quality control, statistical analyses, and file creation and maintenance would become an integral part of the routine, providing additional benefits and cost savings.

RESEARCH ACTIVITIES:

All previous reports have referred to the need to establish a research programme to complement the diagnostic activities of the Service and to utilise the vast amount of material generated by these activities. Such a programme is essential to meet the requirements of the first "object" in the by-laws of the Service, namely:

> "to provide in Victoria facilities for research and investigation with respect to the cytological examination of gynæcological specimens associated with cancer detection and to undertake such research and investigation." (By-law 3 a).

It is envisaged that a research programme should be conducted in two broad areas.

Firstly, there is a need for a detailed analysis of the data already

aspects of this data. Such investigation would include statistical, sociological and epidemiological aspects. Towards the end of 1976 an application was made for a "Health Services Planning and Research" grant to initiate detailed data studies. Although the initial application was not successful, detailed suggestions have been made regarding possible avenues of investigation that could form the basis of another application. However, it is felt that further work on this aspect of investigation should be deferred until a decision is reached regarding the installation of the Service's own computer facilities.

The other area of research would involve the application of a variety of specialized techniques such as immunology, cytogenetics, cytochemistry and electron microscopy to the study of cancer and pre-cancerous conditions of the uterine cervix. As already indicated, the Service has detected nearly 6,000 cases of pre-invasive and invasive cancer. In addition, approximately 7,000 cases of mild and moderate dysplasia, recognized pre-cancerous lesions, have been detected. Currently 5,000 cervical smears are examined each week and these can be expected to yield 6 cases of invasive cervical cancer, 14 cases of pre-invasive cancer, and 36 cases of mild and moderate dysplasia. A most comprehensive follow-up programme is fully established and excellent rapport exists between the senior staff of the Service, the clinicians who use its facilities, and the pathologists throughout Victoria who provide detailed follow-up data. Thus, there is available an extremely valuable and precise method of identifying within the community large numbers of women suitable for investigation. There is evidence that women with a certain genetic structure do have a greater susceptibility to cervical cancer and that this genetic structure may influence their survival from the disease. In addition, there is also a great deal of evidence that development of cervical cancer may be related to viral infection and the herpes simplex virus is strongly suspected as the viral agent. There is thus an opportunity to collect blood from women identified as having cervical cancer or those who are developing the disease and to study such blood by a combination of immunogenetic and immunoviralogic techniques.

CONCLUSION:

As indicated the V.C.(G.)S. continues to operate an extremely efficient, economic and effective cervical cancer screening programme. There is a clear indication that the Service will achieve its primary aim, namely a significant reduction in the death rate from cancer of the cervix among Victorian women. The availability of appropriate computer technology will increase even further the efficiency of the Service whilst there are indications that a research programme of considerable potential value may be initiated.

TABLE 1 DETAILS OF COSTS 1965 - 1977

| Period | No. of Smears | Expenditure | Average Salary Per Staff Member | Salary Cost Per Smear | Service and Materials | Total Per Sm |
|---|---|---|---|---|---|---|
| 1st, 1965 to e 30th, 1965 | 4,928 | $24,068 | $1,725 | $1.70 | $3.18 | $4.88 |
| ancial Years | | | | | | |
| 965 - 66 | 65,859 | $76,659 | $1,725 | $0.56 | $0.60 | $1.16 |
| 966 - 67 | 95,336 | $81,314 | $1,515 | $0.51 | $0.34 | $0.85 |
| 967 - 68 | 98,108 | $101,689 | $1,881 | $0.61 | $0.43 | $1.04 |
| 968 - 69 | 107,794 | $108,355 | $1,965 | $0.60 | $0.40 | $1.00 |
| 969 - 70 | 124,857 | $132,822 | $2,138 | $0.67 | $0.39 | $1.06 |
| 970 - 71 | 137,717 | $156,314 | $3,018 | $0.77 | $0.37 | $1.14 |
| 971 - 72 | 154,884 | $180,481 | $3,574 | $0.76 | $0.41 | $1.17 |
| 972 - 73 | 176,963 | $206,883 | $3,517 | $0.78 | $0.39 | $1.17 |
| 973 - 74 | 190,619 | $260,532 | $4,616 | $0.92 | $0.45 | $1.37 |
| 974 - 75 | 209,365 | $341,873 | $6,280 | $1.15 | $0.48 | $1.63 |
| 975 - 76 | 218,062 | $470,959 | $8,640 | $1.60 | $0.56 | $2.16 |
| 976 - 77 | 228,692 | $562,509 | $9,632 | $1.94 | $0.52 | $2.46 |

NOTE: Costs for the years to 1975 - 1976 are based on accrual accounting;
1976 - 1977 are based on cash accounting.

TABLE 2 STAFF EFFICIENCY 1965 - 1977

| Period | No. of Smears Examined | Full-time or Full-time Equivalent Staff | Efficiency Smears per Staff Member |
|---|---|---|---|
| 1965 - June, 1966 | 70,787 | 27 | 2,622 |
| 1966 - 67 | 95,336 | 32 | 2,979 |
| 1967 - 68 | 98,108 | 32 | 3,066 |
| 1968 - 69 | 107,794 | 33 | 3,266 |
| 1969 - 70 | 124,857 | 39 | 3,201 |
| 1970 - 71 | 137,717 | 35 | 3,935 |
| 1971 - 72 | 154,884 | 33 | 4,693 |
| 1972 - 73 | 176,963 | 38 | 4,657 |
| 1973 - 74 | 190,619 | 38 | 5,016 |
| 1974 - 75 | 209,365 | 39 | 5,368 |
| 1975 - 76 | 218,062 | 41 | 5,318 |
| 1976 - 77 | 228,692 | 44 | 5,198 |