Papers and Originals

DETECTION OF CERVICAL CARCINOMA IN THE GENERAL POPULATION

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Exfoliative cytology is no new science. Walshe, as long ago as 1851, observed fragments of malignant tissue in sputum, and Dudgeon and Patrick (1927), working at St. Thomas's Hospital with Dr. J. Bamforth, examined sputum, urine, and other body secretions for malignant cells. In 1928, in the United States, Papanicolaou used a similar wet fixation technique for diagnosing cancer of the female genital tract. It was not until the 1940's, however, that he realized the full use and significance of this as a routine diagnostic test, and then, in 1943, published his now classic paper with Traut.

In Great Britain 3,500 women die from cervical cancer every year, or, one in a hundred of all female deaths is from cervical cancer. Unfortunately in the great majority of cases it cannot be detected in its early stage by reliance on clinical signs and symptoms, so that death rates continue to be high. The fact that the cervix is so easily accessible makes diagnosis by cytology particularly applicable. There is therefore no technical difficulty, theoretically at least, in applying the method to an entire population.

Cervical cytology has now passed beyond the experimental stage and its diagnostic value has been proved, in the United States, and in Britain by Anderson (1950), Wachtel and Plester (1952), Way (1953), Egerton (1957), and Yule and Cameron (1961). The *British Medical Journal* (1962) expressed, what many leading gynaecologists have felt for some time, that this "method is essentially a screening test not aimed specially at the occasional out-patient but at all patients at risk—that is, it is usually made on a cervix of normal appearance." The Central Health Services Council (1961) recommended that "consideration should be given to the provision of more widespread facilities with commensurate training arrangements."

Background in Aberdeen

Since 1958 a cytology service has been in operation for all women attending the Department of Obstetrics and Gynaecology in Aberdeen. This service has gradually been expanded to the Family Planning Clinics run by the Public Health Department and to general practitioners in the North-east Region, including the islands of Orkney and Shetland.

In Aberdeen the number of smears examined has increased from 1,081 in 1958 to 8,010 in 1961. A detection rate of about 1% is similar to that found by Anderson (1959) and Majury (1961). Of the 157 positive smears in which subsequent cone biopsy specimens of the cervix showed abnormal histology there was evidence of invasive cancer in 42, and 115 showed varying degrees of histological abnormalities of the

cervical epithelium of a type now known to precede invasive carcinoma.

Hospital Screening

The 8,010 smears taken in 1961 include those from women from the programme now to be described. Our experience with cytology in the gynaecological out-patient clinics was encouraging enough to justify a more widespread screening programme. Two practical difficulties had to be faced—the distaste with which some women view a vaginal examination, and the fear engendered by any contemplation of the word "cancer." It seemed easiest to start with women who were actually in hospital. Permission was therefore obtained from surgeons and physicians in the infirmary to take cervical smears from the patients under their care. Since cervical cancer is a disease mainly of parous women, with a maximum incidence between the ages of 40 and 60, it was decided to limit our extension of the scheme to parous women between the ages of 25 and 60 years. With the co-operation of the sisters in charge, a visit was paid to each ward once a week, and smears were taken from suitable patients. The approach was made by a married woman doctor, a brief obstetric history taken, and a pelvic examination suggested. There were only six refusals in over 1,200 cases.

Some inquiring patients asked if cancer could be detected by this examination, and on having the test explained to them expressed the hope that their relations and friends might have the same opportunity for examination. No cases of cancerphobia are known to have been produced; many patients were greatly relieved, particularly those who had previously defaulted from a post-natal examination.

The screening of suitable in-patients of the Aberdeen Royal Infirmary and Woodend Hospitals is now an established routine procedure. In 1961 seven out of 1,207 smears taken were positive. Subsequent histological examination of the cervix showed that invasive cancer existed in three cases, and that the remaining four showed the features characteristic of pre-invasive cancer.

Population Screening

Having found that this test was acceptable to women in hospital, it was decided to extend the service to the general population. About 95% of the women in the City of Aberdeen are registered with general practitioners. The use of general practitioners' lists, with occasional help from the lists maintained by the executive council to avoid duplication, gave the most convenient and efficient method of identifying the women at risk in the city.

Place.—It was decided that the initial approach to the patient should be through the family doctor, and the doctors in the general practices selected were found to be most helpful and co-operative. A carefully phrased letter was composed by the staff of the department and the family doctor, and this was sent to each patient by him, inviting her to attend his consulting-room for examination. It was decided that this would be more acceptable than a visit to a hospital out-patient department or a public health clinic. Furthermore, the examination was conducted by a woman doctor, and many patients have expressed satisfaction at this. There was some apprehension in the waiting-room in the early stage of the experiment, but subsequently, as information about what actually happened became fairly widespread, fear was dispelled.

Method.—A typist extracted from the practitioner's lists the names and addresses of all married women aged 25 to 60 and sent the letter, signed by the family doctor. The letter mentioned the fact that it is possible to detect "cells at the neck of the womb which if not treated might in the future turn to cancer" and likened this diagnostic service to the mass radiography campaign for the detection of tuberculosis. A second letter was sent to most of the patients who did not reply to the first request. In Practice A, for reasons determined by the principals of the practice, a second letter was not sent to all those who did not reply to the first letter.

Technique.—Sessions were held in the general practitioners' surgeries, and about 20 smears were taken in a session of under two hours. A vaginal speculum was inserted, the cervix exposed, and a scrape of the squamo-columnar junction taken with an Ayre spatula. Material was not taken from the posterior fornix, since it has been shown (McLaren and Attwood, 1961; Tolles, Horvath, and Bostrom, 1961) that a cervical scrape is more effective. Smears were made on glass slides and fixed in a solution of 50% absolute alcohol and 50% methylated ether for 15 minutes. They were then taken to the laboratory, stained, and examined. It was feasible for one doctor to take 20 smears in a morning and interpret a further 20 taken the previous day. The smears were all taken by the same doctor, and carefully examined by one of four cytologists. All abnormal smears were examined usually by all four cytologists, and final responsibility for arranging for the supervision of the patient and for cone biopsy rested with the senior gynaecological registrar in charge of cytology.

Degree of Co-operation

Table I shows that 2,683 smears were taken in the course of the survey of three general practices, and 18 unsuspected early cancers were discovered plus one case of clinically diagnosable cervical carcinoma.

The results in the three practices are compared in Table II. A "reply" is defined as the acquisition of

information about the patient irrespective of whether a smear was subsequently taken or not. The reply rate is calculated from the number of patients who actually received the letter.

TABLE I.—Results of General Practice Survey

Total No. of women invited	5,340
Total No. of smears taken	2,683
Total No. of abnormal smears	24
<i>Analysis of 24 Abnormal Smears</i>	
Clinical case	1
Pre-invasive carcinoma	13
Invasive carcinoma	5
Chronic cervicitis	5

The findings showed a detection rate of 0.67%.

TABLE II.—Comparable Reply Rate in Three Practices

Practice	No. Invited	No. Trace at Address	No. Replied	No. Smears Taken	Cases Detected
A	1,483	19	1,159 (79%)	1,022 (69%)	4 (0.4%)
B	3,156	339	1,459 (51%)	1,295 (41%)	11 (0.9%)
C	701	86	448 (71%)	366 (52%)	3 (0.9%)
Total	5,340	444	3,066 (58%)	2,683 (50%)	18 (0.7%)

The reasons for not taking smears from all those who replied varied, and included ill-health, previous hysterectomy, and smears taken less than one year previously. In this survey smears were not taken from pregnant women as they are taken routinely at all post-natal examinations.

In Practice A there was active co-operation from the doctors, who in the course of their day-to-day practice did all they could to encourage their women patients to attend for the test. In Practice B the doctors, while tolerating the investigation, were less enthusiastic. In an attempt to measure the influence of the family doctor on the reply rate the doctors in Practice C were asked to take no part in the investigation.

It will be noticed (Table II) that in Practices B and C the percentage of smears taken was lower than in Practice A, but in both the percentage found to be positive was higher. It was considered that the social content of Practices B and C was probably similar. The higher reply rate in Practice A was thought to be due not only to the helpful attitude of the doctors, but also to the fact that more of the women came from upper social classes. This latter fact probably explains the low detection rate. The apparent contradiction in Practice C between a high reply rate and a low percentage of smears taken is due to the home visits paid in this practice by health visitors, who were therefore able to elicit some knowledge about the patient and thus to register a reply and classify it, even if it was only a definite refusal to attend for examination.

The influence of various methods of approach is considered in Table III. In Practices A and B letters only were sent to the patients, but, as already mentioned, the doctors in Practice A were much more active in encouraging their patients to attend than they were in Practice B. In Practice C patients who did not reply to the first letter were divided into three groups: those

TABLE III.—Reply Rate

	Practice A			Practice B			Practice C		
	Sent	Replied		Sent	Replied		Sent	Replied	
		No.	%		No.	%		No.	%
First letter	1,483	1,038	70	3,156	1,186	38	701	317	45
Second letter	306	121	40	1,596	273	17	99	33	33
Visited by H.V.	—	—	—	—	—	—	114	55	48
Visited by lay visitor	—	—	—	—	—	—	117	43	37
Total replies		1,159			1,459			448	

H.V. = District health visitor.

in the first group were sent a second letter, those in the second were visited in their homes by a health visitor on the staff of the public health department, and those in the third group were visited by lay non-medical women voluntary workers.

The health visitor received replies from 48% of those visited, many promising to attend, but in fact only 28 (24%) out of the 114 visited did attend. The lay visitors were even less successful, and only 16 out of 117 visited did attend. The second letter was sent to 99 women, 28 of whom attended for examination. Although the reply rate was less by this method in that we had information about only 33% of the women, the reply usually took the form of a visit to the surgery for examination. Thus the return was much greater and the expenditure of time and effort much less than that required for home visits. It is interesting to note that of the 18 cases detected in the three practices six had attended in response to the second invitation. Of the 231 women visited by health visitors or lay workers, 54 definitely refused the examination. There is no means of knowing how many refusals would have been found in the other groups if home visiting had been tried.

Comparison of Those Replying in each Practice

The age distribution of those who replied is the same in all three practices. Each ten-year age-group between 30 and 60 years contained between 25 and 30% of the total, the rest being either over 60 or under 30.

There was a slight difference in the parity distribution of the patients attending. In Practice B, which had the highest detection rate, the average parity rate was 2.6. The rates in Practices A and C were 2.3 and 2.4 respectively.

The ages of general-practice patients attending for screening are compared with those from other sources (Table IV). It can be seen that in the practices and the hospital wards the age distribution and the incidence of positive smears is the same. Although the women examined post-natally are much younger than the others, the detection is still 0.6%, owing to the fact that the incidence of positive smears is highest in the 30-39 year age-group.

TABLE IV.—*Comparison of the Age Composition of Various Groups of Women Examined Cytologically*

No. of Patients	Group	Detection Rate	Age-group (Years)				
			20-29	30-39	40-49	50-59	60+
2,683	Practices	0.66%	13%	26.8%	27.6%	28.2%	4.2%
1,513	Wards	0.6%	7.7%	21.4%	32.3%	33.3%	5.1%
1,342	Post-natal	0.6%	49.0%	48.2%	2.7%	—	—
3,477	Gynae. clinic	1.2%	14.4%	32.4%	27.5%	16.4%	9.0%
Average population			19.8%	25.1%	24.9%	17.5%	12.7%

The 18 patients with positive smears in the general-practitioner survey come predominantly from social classes III, IV, and V, the husbands being mostly manual workers. A parallel study was made of positive smears from all sources, and the patients were found to have the same age, parity, and social-class distribution as the patients with positive smears in the general-practitioner survey.

Non-cooperators

Thirty-four patients in Practice A who did not attend or reply in any way, and about whom nothing was known except their name and address, were subsequently interviewed by a health visitor, who has been attached

to this practice for several years. The reasons why the patients had not attended are given in their own words in Table V. The largest group, one-third of the total, gave the reason, "Can't be bothered." It would have been interesting to know if these women adopt a similar attitude to life's problems generally, or to other preventive health measures such as immunization and vaccination.

TABLE V.—*Reasons for Non-cooperation Elicited by Health Visitors*

Practice A (34 Cases)	Practice C (36 Cases)
Family ties 3	Definite refusals 13
Affraid of hospital .. 1	Working 2
Too busy at work 2	"Coming" and did not .. 7
Previous serious illness .. 1	Don't want to know .. 5
Affraid of cancer 7	Done before 2
Might attend later 7	Hysterectomy 3
"Can't be bothered" .. 12	Dislikes hospital 2
Away from home 1	Wanted own doctor 2

Table V also gives the reasons for non-cooperation to the initial visit by health visitors in Practice C and elicited by them at a later date. It can be seen that in this practice more women firmly refused to come than in the other practices but would give no definite reason. This is consistent with the fact that this practice appeared to contain a higher percentage of women in the lower socio-economic groups than Practice A. They are usually the least articulate.

Cancerphobia

So far as can be ascertained, no case of cancerphobia resulted from our investigation. Many of those who attended knew of the existence of cancer in members of their family and were afraid they might develop it. Therefore, fear may be as likely to cause a person to attend as to stay away. It is very difficult to get precise information about the effect of fear of cancer on the patients' reaction to a campaign for early detection, and important reliable conclusions cannot be drawn from the results of the inquiry shown in Table V of the assessment of reasons for non-cooperation. It is quite possible, for example, that fear of cancer might be the real cause underlying such responses as "Can't be bothered" or of straight refusals without any accompanying explanation. Experience has shown, however, that women presenting themselves for examination whose smears are found positive take the news very well, and, as a result of the excellent post-operative progress, give good publicity to the fact that precancerous lesions can be detected and treated while the prognosis is still excellent. Relatives of those patients are also enthusiastic advocates of screening. After the scheme had been running for 18 months it was found that a group of 100 parous women, who were interviewed for an entirely different research programme, knew of "the new test for cancer" in Aberdeen.

Atypical Smears

From March, 1958, to March, 1961, 256 (4%) of 6,400 smears examined were found to have abnormal but not definitely malignant cells. The women have had repeat smears taken over periods varying from three months to two years, and Table VI shows that in 176 (68%) cases the repeat smear was normal. Thirteen cases re-examined showed the presence of cells typical of pre-invasive or invasive cancer. This may have been due to rapid progression of the lesion in this relatively

short time of 3 to 24 months or to the unsatisfactory nature of the original smear.

TABLE VI.—*Analysis of Atypical Cervical Smears*

Clinically diagnosed cases	8	(3% of all atypical smears)
Advanced to invasive	5	(5% of all atypical smears)
Advanced to pre-invasive	8	
Returned to normal	176	(68% of all atypical smears)
Still atypical	59	(23% of all atypical smears)
Total	256	(4% of all smears)

In eight clinical cases with atypical smears initially, repeat smears suggested that the lesion was malignant, and histological examination confirmed this. Smears from clinically diagnosable cancer of the cervix can be unsatisfactory and difficult to interpret. Cells are often scanty and difficult to see because of the presence of leucocytes, red blood cells, mucus, and necrotic debris. A better smear may be obtained if care is taken to remove much of this before scraping the cervix. Fortunately in such cases a biopsy of the cervix would obviously be indicated on clinical grounds alone, and there should therefore be little or no risk that a cancer would be missed by reliance on cytology alone.

Length of Pre-invasive Stage and Estimated Detection Rate

The frequency with which invasion supervenes upon a pre-invasive lesion and the time taken to do so is not known precisely. Petersen (1955) calculated that at least one-third of all pre-invasive lesions certainly become invasive. In Vancouver, Boyes, Fidler, and Lock (1962) suggest the figure is as high as 60%. Lawson (1956), working in the midwifery department in Aberdeen, calculated from the annual incidence of clinical cases of cervical carcinoma that the proportion of positive smears should be about 0.5% if the latent preclinical period was 10 years. The Census data of 1951 made it possible to estimate that in the year 1950 there were about 20,000 married women between the ages of 35 and 64 in the City of Aberdeen who between 1950 and 1959 might be expected to produce 99 clinical cases of cancer. If 10 years is accepted as the minimum latent period, and assuming that all lesions could be discovered, then 99 latent cancers should have been found—a detection rate of 1 in 200 (0.5%). (With a five-year latent period the detection rate could be only 0.25%.)

If examination of all or any random sample of the 20,000 women had given a higher detection rate than 0.5%, this would mean (1) that the sample was not representative of the group as a whole, (2) that some of the lesions discovered were not destined to become invasive, or (3) that some cancers evolve over a longer period than 10 years. A lower detection rate would indicate that either the diagnostic technique was not always successful or that only some cervical neoplasms are preceded by a protracted pre-invasive phase. Our figure of 0.67% for the three general practices is roughly

in line with Lawson's calculations, taking into consideration that all cases do not necessarily progress to clinical cases. It is also consistent with the view that the length of the pre-invasive stage is about 10 years (Boyes *et al.*, 1962). Even here selection factors operate, as can be seen from the difference in the rates of detection between Practice A and Practices B and C, due probably to variations in social composition of its practices.

Yule and Cameron (1961) found that the overall incidence of positive smears was 1.2% in parous women at a gynaecological and out-patient clinic. It varied from 0.2% in those under 30 to 1.9% in the 40-49 age-group. The fact that the highest incidence of clinical carcinoma of the cervix was found in women aged 50-64 supports the view that the latent period is 10 years or more in most cases. This is also supported by the evidence in Table VII, derived from Aberdeen data, which shows that among women aged 25 to 60 the mean age of those with a pre-invasive lesion was 39.6 years, which is four years less than that of women with

TABLE VII.—*Mean Age of Patients Aged 25-60 With Positive Cervical Smears and Clinical Cancer of the Cervix*

Stage	Mean Age (Years)	No. of Cases
Pre-invasive	39.6	130
Invasive	43.6	48
Clinical	48.3	273

clinically unsuspected invasive cancers and nine years less than that of women with clinically diagnosed cancer. Almost 65% of women have their first baby before the age of 25 and the incidence of positive smears is very low in women under 30, reaching its maximum in the 40-49 age-group. If, as many believe, the process is initiated after the first birth there must be a long gap between this and the appearance of positive cells, and on average another nine years before the appearance of clinical signs and symptoms. If we were to include all clinical cancers irrespective of age when detected the average age would be 52.7 years, making the average interval from the appearance of the positive smear 13 years. Boyes *et al.* (1962) found the difference in age between those with a positive smear and those with clinical cancer to be 17 years.

It may be concluded that re-screening at intervals of five years should detect most cancers before they present clinically. This seems more realistic than to attempt to examine every patient at intervals of 6 to 12 months as has been recommended by many.

Survival Rates

Table VIII shows that the survival rate in Aberdeen of clinically diagnosed cases treated in the years 1948-53 is 41.8% (Lawson, 1962). The standard treatment was local application of radium followed in stages II and III cases by deep x-ray therapy to the glands. In some women with stage I and stage II lesions considered to

TABLE VIII.—*Five-year Survival Rate in Clinically Diagnosed Cancer of the Cervix (Aberdeen)*

Stage	1942-7					1948-53				
	Total	Dead	Unknown	Survivors		Total	Dead	Unknown	Survivors	
				No.	%				No.	%
I	42	15	4	23	54.8	86	24	2	60	69.8
II	112	74	5	33	29.5	111	60	1	50	45.0
III	71	57	2	12	16.9	78	63	0	15	19.2
IV	28	28	0	0	0.0	24	24	0	0	0.0
Total	253	174	11	68	26.9	299	171	3	125	41.8

From Lawson (1962).

be good operative risks a Wertheim hysterectomy was performed six to eight weeks after the local radium treatment of the cervix.

Since 1958 the usual treatment of preclinical invasive carcinoma diagnosed on the basis of a positive cervical smear and subsequent histological examination of cervical biopsy was the application of radium to the cervix using the Sheffield technique. Where alterations in the epithelium thought to be typical of pre-invasive "cancer" were found total hysterectomy was performed in most cases. This was done for the following reasons. Most of the women had finished child-bearing, were over 30 years of age, and, being aware that suspicious cells had been discovered in the smear, were anxious to have their source removed. In some cases, also, gynaecological symptoms existed that were likely to be relieved by hysterectomy. The mortality from hysterectomy is now so low and the general ovarian activity so well preserved that there is much to recommend it.

Another point in favour of this policy is that not only do one-quarter of those with positive smears have invasive cancer demonstrable histologically but at least one-third of the remainder will progress to invasive cancer. In some cases, of course, a satisfactory ring biopsy will result in the lesion being completely removed, making hysterectomy less necessary. If hysterectomy is not performed the patient must be re-examined at intervals and reinvestigation in hospital undertaken if positive cells reappear. This policy has obvious drawbacks, not least the effect on the patients' morale.

There is, of course, no need to bring pressure to bear on women who do not wish to have the uterus removed, especially young women who desire more children. Re-examination at suitable intervals is easy to arrange and would in the circumstances be acceptable to the patient. Our experience of the cytological diagnosis of cancer is too short to give any estimate of survival rates. Out of 157 women found to have a positive smear and abnormal histology in the years 1958-61, 42 had invasive cancer diagnosed histologically and all were alive and free from recurrence at the time of writing. Since the survival rate of stage I clinically diagnosed cases is 70% there seems every likelihood that very few of these patients with preclinical cancer should die. All the 115 patients with pre-invasive "cancer" were also alive. The majority were treated by hysterectomy, and in view of the very low mortality from this operation the policy seems justifiable until some more precise method is available to distinguish those patients in whom the lesion will progress to invasive cancer.

Practical Problem of Screening

According to the census of 1951 the population of Aberdeen City at that time was 182,729 and about one-fifth of these were married women aged 25 to 60 years—36,000 women in all. It would seem reasonable to screen these women every five years, which would necessitate the examination of 7,500 women every year, a load within the capacity of the present staff. However, the women most likely to develop cancer of the cervix are on the whole the least likely to attend for examination. The most effective method of overcoming inertia is the active co-operation of the family doctor. From our limited experience it would seem that many doctors are either too busy to help or would have to have the advantages of this technique put to them more clearly and enthusiastically. The greater the number of women

examined the more quickly will the benefits of early diagnosis and treatment spread. This should lead to greater co-operation from the public. We feel that the facts are now sufficiently well established to make a wide appeal justified.

Re-screening is proving difficult in the U.S.A. because of rapid and widespread movements of population, random selection of patients to be screened, and the difficulty of a continuous and unified recording system. In the U.S.A. many women are screened very frequently, often not by the same doctor. We have the advantage of a more static and more easily defined population, and plan to re-screen the patients at intervals of five years. If our calculations are correct, nearly all cases of cervical carcinoma should be detected in the pre-clinical phase. If rapid progression should prove to be exceptional, positive smears found on re-examination after a five-year interval should be coming from a pre-invasive lesion or, less often, an early invasive but not clinically diagnosable cancer. Firm knowledge on this point is required before we can assess how successful a detection campaign would be. Generally speaking, the more frequently examinations have to be done to be effective, the less likely is such a scheme to succeed.

Who is to Re-screen?

The women most at risk, those of high parity and low social class, are less likely to come for periodical examination than women from the upper socio-economic groups, who are much less likely to develop the disease. Therefore the problem of "selling" the test to the women most concerned is not easy. The family doctor is in the best position to do this. The taking of a cervical smear is well within the capacity of any interested general practitioner, but many do not seem to have the facilities, the time, or the will to do it. Smears cannot be taken during routine consulting hours, except in a random fashion, and no systematic cover of all patients at risk would be possible. Special arrangements require to be made and the necessary time set aside. This is probably easier to arrange in a well-organized and well-equipped group practice. Before a comprehensive service could be operated successfully a great increase in hospital diagnostic facilities would be necessary.

Conclusions

If the death rate from cancer of the cervix is to be reduced substantially in the foreseeable future, women in all sections of society must be induced to undergo a cytological test at suitable intervals. In view of limited resources, skill, and money, the service must be carefully planned, otherwise some women will be examined at unnecessarily frequent intervals and others too infrequently or not at all. There is much to be said for concentrating our attention on parous women aged 25 to 60, since few smears are positive before the age of 25, and if the test is negative at the age of 60 the patient has a very good chance of escaping the disease altogether or of having its onset delayed till she is aged 70 or more. The oldest age-group would in any case be more difficult to persuade to undergo a routine test. The test should be done on all parous women attending a gynaecological out-patient clinic irrespective of age. When the back-log of women not previously examined has been accomplished it could be possible to concentrate on the cohorts of younger women entering the high-risk group. We have calculated that if all parous women aged 25 to 60 were examined at five-yearly

intervals—that is, eight times in all—the number of smears to be examined in a city of 200,000 would be about 8,500 per year. The evidence points to the fact that this would result in a great reduction in the number of cases diagnosed only after clinical signs and symptoms develop. There is no insuperable difficulty in accomplishing this, given adequate financial backing.

Costs.—The Medical Officer of Health of the City of Aberdeen, Dr. I. A. G. MacQueen, has estimated that the cost of detecting each case of tuberculosis in the x-ray campaign was approximately £60. Table IX shows the cost of inviting 5,340 women in the general practices to attend for examination, and taking and examining 2,683 smears from them. The cost of con-

TABLE IX.—*Cost of General Practice Survey*

Smears taken, 2,700 at 1s. per smear	£ 135
Half salary of typist for clerical work	200
Half salary of junior technician for staining	200
Salary of doctor taking and reading smears	600
	1,135

Detected 19 cases of cancer = £59 per case detected.

sumable laboratory and clerical materials is under one shilling per smear taken. The biggest item was the part-time salary of the doctor taking and reading the smears. Since 19 cases of cancer, invasive and pre-invasive, were detected, the cost per case amounts to £59. There is, of course, the cost of biopsy of the cervix and subsequent histological examination, but at least half of these patients would eventually arrive in hospital in any case, and would cost the hospital much more than if admitted in an early stage of the disease.

Summary

The Papanicolaou technique for cervical cytology has been applied systematically to the parous women aged 25 to 60 years in three general practices in Aberdeen. A total of 5,340 women were invited to attend and ultimately smears were taken from 2,683. Eighteen cases of clinically unsuspected pre-invasive or early invasive carcinoma were detected, a rate of 0.67%, which is consistent with the occurrence of clinical cervical carcinoma in Aberdeen.

The reply rate was highest (79%) and the detection rate was lowest (0.4%) in the practice where there was the greatest degree of co-operation from the family practitioners, and where the social class of the practice was possibly higher than average. The detection rate was high (0.9%) in practices which had the lowest percentage of smears taken (41% and 52%) and a lower than average social class content.

There was no evidence to suggest that the survey increased the incidence of cancerphobia; on the contrary, it stimulated interest in the problem and a sense of relief that a cure was possible.

The mean age of 130 Aberdeen women aged 25 to 60 years with pre-invasive "cancer" of the cervix detected by cytology was 39.6 years. In 48 patients with a histologically diagnosed invasive cancer the average age was 43.6 years. The mean age of women aged 25 to 60 with clinically diagnosed cancer of the cervix was 48.3 years. This suggests that there may be a steady progression over nine years from pre-invasive to clinical carcinoma. If women over 60 years of age with cancer of the cervix are included the mean age of clinically diagnosed cancer is raised to 52.7 years.

The cases of cervical carcinoma detected by the cytological technique are predominantly women of higher

parity and from the lower social classes (III–V). Experience shows that they are least likely to volunteer for this examination. Particular attention must therefore be given to the problem of eliciting their co-operation.

Systematic screening of the whole population most at risk (parous women between 25 and 60 years) would be practicable if one-fifth of the group were screened annually and re-screened at five-year intervals.

The cost, in Aberdeen, of detecting each case averaged about £60, the same as the cost of detecting a case of tuberculosis by a mass radiography campaign.

We are most grateful for the co-operation of the general practitioners who provided the facilities for this pilot survey, for the help of the district health visitors and the Women's Voluntary Services, and the technical assistance of Miss F. H. D. Cameron and her staff. Miss Hazel Moore was entirely responsible for all the clerical work involved. We are indebted to Dr. I. A. G. MacQueen, Medical Officer of Health, City of Aberdeen, for his interest. One of us (J. E. M.) was in receipt of a grant from the Secretary of State for Scotland through the Advisory Committee for Medical Research.

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The setting up of a Standing Conference of Organizations of Social Workers is announced by seven associations of professional social workers. The Standing Conference will represent about 5,000 workers in child care, general and family case work, moral welfare work, psychiatric social work, almoning, probation, and other trained social workers and teachers of social work. The associations concerned have agreed that they have a long-term objective to establish a unified national association of social workers based on a minimum qualification for membership. The Standing Conference is taking over the work of the Joint Training Council for Social Work and it will set up a parliamentary and public relations committee and a committee to be concerned with international relations. The officers of the Standing Conference have yet to be elected. The temporary address is 42 Bedford Square, London W.C.1. The Standing Conference may be seen as part of the general drawing together of professional social workers as a result of developments in training and the wide acceptance of the need for the integration of social work services.