Collective Investigation

INTO

THE INCIDENCE OF CANCER OF THE
BREAST, AND ITS HISTORY
AFTER TREATMENT

Report by

ARTHUR P. LUFF, C.B.E., M.D., B.Sc., F.R.C.P.

CONSULTING PHYSICIAN TO ST. MARY'S HOSPITAL; HONORARY
DIRECTOR OF COLLECTIVE SCIENTIFIC RESEARCHES TO THE
BRITISH MEDICAL ASSOCIATION

The British Medical Association in 1928 initiated a collective investigation scheme, and started with an inquiry into the treatment of varicose ulceration, which was followed in 1929-30 by an inquiry into the after-history of gastro-enterostomy; in connexion with both of those investigations reports have been issued.¹ In 1929 it was decided to conduct an inquiry into the incidence of cancer and its history after treatment. A memorandum was issued to medical practitioners stating that the inquiry was limited to the following conditions: carcinoma of the breast, cervix, rectum, and tongue. It was to cover a period of one year from October, 1929, to September, 1930, and practitioners taking part in the inquiry were requested to keep a record of all cases that came under their notice during that period. It was stated that the scope of the inquiry was not limited to new cases, but was to include any cases that came under their notice during the period under review. The object of the inquiry was to obtain precise information as to the previous history of patients suffering from the above-mentioned forms of carcinoma; of the actual evolution of the disease itself, and especially of the first symptom which had called attention to it; of the result of any treatment undertaken, and of the duration of the disease when treated and untreated. Questions were included relating to family history in the hope that the answers would throw some light on the influence of hereditary predisposition on the causation of cancer. Forms dealing with the questions to be answered were issued to those members of the Association who were willing to take part in the inquiry.

The returns of cases of cancer of the breast only are dealt with in this report. The returns for cancer of the cervix, tongue, and rectum will be reported on later.

In determining the results of treatment the cases that survived have been divided into two groups: (a) the survivals that had been under observation at the time of reporting for less than four years; and (b) those that had been under observation at the time of reporting for four or more years. As a corollary of the one-year period laid down in the memorandum a large number of cases were returned which had been under observation at the time of reporting for less than four years, although it is highly probable that many of them, if they had been kept under more prolonged observation, would have passed into the other group, of four or more years. Therefore, in connexion with this report, it must be kept in mind that the number of survivals for four or more years in good health after operation does not represent the number which would have been reached if all the cases had been kept under observation for a longer period; nevertheless, it will be found that the number of cases, though comparatively small, is of great value in comparing the survival rates under different conditions.

¹ *British Medical Journal*, December 22nd, 1928; December 7th, 14th, and 28th, 1929; February 22nd, 1930.

Reports of 1,651 cases of cancer of the breast have been received. These reports are made up as follows:

Married cases (living)	877
Single cases (living)	276
Deaths (married and single)	370
Male cases	13
Reports inadequately filled in	115

The 13 male cases and the 115 cases the reports of which were inadequately filled in have been rejected as useless for the purposes of this inquiry. The remaining 1,523 returns have been carefully collated, and the results are embodied in the various tables, followed by the comments made thereon and the deductions that have been drawn.

AGE INCIDENCE

The age was not given in 11 cases.

TABLE I.—Age Incidence of all Cases

Age	No. of Cases	Percentage
19-30 years	10	0.7
30-40 "	93	6.1
40-50 "	390	25.8
50-60 "	489	32.3
60-70 "	343	22.7
Over 70	187	12.4

This table shows that two-thirds of the cases occurred in patients of 50 years and over. Of the 10 cases under 30 years of age two occurred at the remarkably early ages of 19 and 21, and as a matter of interest the following details of these cases are given.

1. Aged 19 years at time of operation. Unmarried. Lump in breast first noticed by patient one year before a complete operation was performed. No palpable enlargement of axillary glands. Microscopical examination demonstrated "carcinoma." Prophylactic treatment with x rays was used fortnightly for ten months after operation. Patient was in good health at time of reporting (two years after operation). Grandmother died of cancer.

2. Aged 21 years at time of operation. Unmarried. Lump in breast noticed a short time before a complete operation was performed. No palpable enlargement of axillary glands. Microscopical examination demonstrated "carcinoma." Secondary deposits occurred in abdomen six to twelve months after operation and in spine later. Death fourteen months after operation. No family history of cancer.

CHILD-BEARING IN RELATION TO CANCER OF THE BREAST

Amongst the total of 1,146 married women, 844 were parous, 250 were non-parous, and no information was given in 52 cases. The parous have been divided into two groups: (a) those that had less than four children, and (b) those that had four or more children; and in Table II the percentages in the two groups as furnished by the returns of this inquiry are compared with the corresponding percentages in the same groups of the married parous women in the entire population, as calculated from the figures given in Table 19, p. 6, vol. xiii, of the 1911 Census issued by the Registrar General.

TABLE II

No. of Children	Cancer of Breast Returns of Present Inquiry	Census Returns of 1911 for the Entire Population
	Per cent.	Per cent.
Less than 4	66.4	52.0
4 or more	33.6	48.0

Attention has been directed by some writers to the possibility of the association of cancer of the breast with the production of a large number of children. Such an association is not borne out by the figures obtained in this inquiry, since if such an association existed, the

percentage of cancer of the breast cases in women that had four or more children would be higher than the 48 per cent. of all married parous women, whereas it is considerably lower. The figures in Table II tend to show that the greater the number of children the less is the liability to cancer of the breast.

Cancer of the Breast in Parous and Non-parous Married Women, and in Single Women

In Table III the percentages of cancer of the breast in the parous and non-parous married women, as furnished by the returns of this inquiry, are compared with the relative percentages of parous and non-parous married women in the entire population, as calculated from the 1911 Census (reference as above).

TABLE III

Married Women	Cancer of Breast Returns of Present Inquiry	Census Returns of 1911 for the Entire Population
	Per cent.	Per cent.
Parous	77.0	83.0
Non-parous	23.0	17.0

This table shows that there is a relatively higher proportion of cancer of the breast in non-parous women than in parous, as compared with the relative proportions of parous and non-parous women in the entire population.

In Table IV the percentages of cancer of the breast in married and single women as furnished by the returns of this inquiry are compared with the relative percentages of married and single women in the entire population at 45 years of age and upwards as calculated from Table 33 of the general tables of the census report for 1921.

TABLE IV

	Cancer of Breast Returns of Present Inquiry	Census Returns of 1921 for the Entire Population
	Per cent.	Per cent.
Married	75.0	85.0
Single	25.0	15.0

This table shows that there is a relatively higher incidence of cancer of the breast in single women than in married, as compared with the relative proportions of married and single women in the entire population. Tables III and IV taken together apparently show that there is a somewhat greater liability to cancer of the breast in both non-parous and single women than in the parous and married women. All the above-mentioned statistics tend to support Lane-Claypon's reference¹ to the possible beneficial physiological effects of marital intercourse on the aetiology of cancer.

The statistics in Table V have been worked out from the returns of this inquiry to ascertain whether the fertility or non-fertility of women has any influence on the after-operation results.

TABLE V

	Survivals for Four or More Years in Good Health after Operation	Recurrences after Operation
	Per cent.	Per cent.
Married (parous) ...	25.3	22.3
Married (non-parous) ...	28.2	24.3
Single	29.1	20.9
Parous, that had less than four children	23.6	20.1
Parous, that had four or more children	29.1	24.4

From this table it would appear that the influence of fertility or non-fertility of women on the after-operation

¹ Report No. 28 on Cancer of the Breast, Ministry of Health, 1924, p. 103.

results is negligible. It may be mentioned, in addition, that the return of the total number of deaths after operation among the parous is practically the same as that among the married non-parous and single women combined.

SUCKLING

Information as to suckling was given in 506 of the married cases that were alive after operation at the time of reporting. Of these women 429 suckled their children and 77 did not. No very reliable information can be gained from so small a number of cases, but it was thought desirable to compare the survival rate for four or more years and the recurrence rate in the two groups, and the results are shown in Table VI.

TABLE VI

	Survivals for Four or More Years in Good Health after Operation	Recurrences after Operation
	Per cent.	Per cent.
Suckled	23.5	22.8
Non-suckled	23.6	15.6

From this table it would appear that suckling has some prejudicial effect on the after-operation results, although it must be remembered that the statistics are obtained from a comparatively small number of cases.

FIRST SYMPTOMS THAT DIRECTED THE PATIENT'S ATTENTION TO THE BREAST CONDITION

Information on this point was given in 931 cases (married and single), as shown in Table VII.

TABLE VII

First Symptom Noticed by Patient	No. of Cases
Lump in breast	740
Lump and pain	81
Pain	48
Discharge from nipple	35
Retraction of nipple	23
Hardness of breast	2
Enlargement of axillary glands	2

It will be seen from this table that pain alone as a first symptom was present in only 5.1 per cent. of the cases.

Interval between First Symptom and Operation

The interval of time that elapsed between the first symptom that directed the patient's attention to the breast condition and the date of operation was given in 715 cases (married and single), who all survived after operation, and Table VIII shows in column (a) the long periods which many patients allowed to elapse before seeking medical aid, although in the great majority of the cases operation followed within a few days of the recognition of the condition by the medical practitioner. In columns (b) and (c) are shown respectively the survival rates for four or more years, and the recurrence rates among the various periods.

TABLE VIII

Interval of Time between First Symptom and Operation	(a) Percentages of Time Intervals	(b) Survivals for Four or More Years in Good Health after Operation	(c) Recurrences after Operation
		Per cent.	Per cent.
Under 1 month ...	32.1	31.3	13.9
1-3 months ...	23.6	29.0	14.2
3-5 months ...	15.1	23.5	27.0
6-12 months ...	11.9	23.5	27.1
Over 1 year ...	16.2	16.4	34.5

This table shows the fairly corresponding decrease in the survival rate in good health for four or more years, and the fairly corresponding increase in the recurrence rate according to the length of time allowed to elapse between the first recognition by the patient of breast trouble and the operation.

Among the returns of deaths after operation information was given in 192 cases of the interval of time that elapsed between the first symptom that directed the patient's attention to the breast condition and the date of operation. Table IX shows the respective mortality rates for the different time intervals.

TABLE IX

Interval of Time between First Symptom and Operation	Respective Mortality Rate
	Per cent.
Under 1 month... ..	5.2
1-3 months	16.7
3-6 months	15.6
6-12 months	25.5
Over 1 year	37.0

This table shows the fairly corresponding increase in the post-operative mortality rate according to the length of time allowed to elapse between the first recognition by the patient of breast trouble and the operation.

BREAST TROUBLES ANTECEDENT TO CANCER

In only 19.8 per cent. of all the cases was any history obtainable of breast trouble preceding the cancer. The various forms of such trouble are given in Table X. The form of injury in the majority of cases was a blow of some kind, but the history of the injury was in many cases of a somewhat dubious nature.

TABLE X

Breast Troubles Antecedent to Cancer	No. of Cases
No history of any trouble obtained	1,221
Injury	139
Chronic mastitis	73
Abscess	36
Sore nipple	30
Paget's disease... ..	24

Preceding breast troubles do not appear to be a factor of much importance in the development of cancer of the breast.

PAIN IN CONNEXION WITH THE GROWTH

Pain was completely absent prior to operation in two-thirds of the cases, and in the great majority of those in whom it occurred the pain was not of a severe character.

FAMILY HISTORY

This consisted of statements made by the patients to the medical practitioners of any relatives that had died of cancer, but it was impossible for the medical practitioners in most of the cases to verify the statements. Only 23.1 per cent. of the patients gave a family history of cancer, the remaining 76.9 per cent. stated that they were not aware of the existence of cancer in any members of their families. The 23.1 per cent. was made up as follows:

18.7 per cent. gave a history of 1 relative that had died of cancer.
2.8 per cent. gave a history of 2 relatives that had died of cancer.

1.6 per cent. gave a history of 3 or more relatives that had died of cancer.

As regards the sex distribution of the alleged cancer among relatives—

63.7 per cent. gave a history on the female side only.

30.1 per cent. gave a history on the male side only.

6.2 per cent. gave a history on both the male and female sides.

So far as the results of this inquiry into the family history go it would appear that the influence of hereditary predisposition on the causation of cancer of the breast is not a dominant factor.

SITUATION OF TUMOUR

TABLE XI

Situation	Percentage
Left breast	52.0
Right breast	46.8
Both breasts	1.2

The situation was further given in the returns according to the position of the tumour in the centre or in one of the quadrants of the breast. The tumours in the centre position include the small number of cases in which the entire breast was involved.

TABLE XII

Situation in Breast	Percentage
Upper outside quadrant	43.9
Centre	19.0
Lower outside quadrant	15.4
Upper inside quadrant	14.1
Lower inside quadrant	6.6

CHARACTERS OF THE TUMOUR

Information as to induration, mobility, and ulceration was given in 1,470 cases.

TABLE XIII

Character of Tumour	Percentage
Induration	58.4
Mobile	51.2
Fixed	28.3
Ulceration	12.3

The majority of the cases of ulceration occurred among the inoperable cases and those in which operation was refused.

STAGE OF THE DISEASE

This refers to the absence or presence of secondaries at the time of examination of the patient and when first seen. The classification used is similar to that adopted by Lane-Clayton (Report No. 51, p. 17, to the Ministry of Health, 1928)—namely:

Class A.—Axillary glands not obviously involved.

Class B.—Axillary glands involved, and no data offered as to further spread of the disease.

Class C.—The disease extends to some tissue outside the breast other than the axillary glands.

The relative percentages in the three classes of all the cases, including the inoperable cases and those that refused operation, are shown in Table XIV.

TABLE XIV

Stage of Disease	Percentage
Class A	39.8
Class B	52.9
Class C	7.3

The 7.3 per cent. in Class C is, of course, heavily weighted by the comparatively large number of advanced cases that occurred among the inoperables and those that refused operation. This is clearly shown by the relative

percentages in the 130 inoperable cases in which information was given as to the stage of the disease, and which are shown in Table XV.

TABLE XV

Stage of Disease	Percentage
Class A	4.6
Class B	34.6
Class C	60.8

Post-operative Results According to the Stage of the Disease

Information of the stage of the disease was given in 926 cases (married and single), which all survived after operation and were alive at the time of reporting. The relative percentages in the three classes are shown in Table XVI.

TABLE XVI

Stage of Disease	Percentage
Class A	43.2
Class B	53.6
Class C	3.2

This table merely represents the proportion of operations performed on the three classes of cases that were alive at the time of reporting. The survival rates for four or more years and the recurrence rates in the three classes are shown in Table XVII.

TABLE XVII

Stage of Disease	Survivals for Four or More Years in Good Health after Operation	Recurrences after Operation
	Per cent.	Per cent.
Class A	32.5	10.5
Class B	24.6	25.8
Class C	3.3	70.0

This table shows the marked decrease in the survival rate and the marked increase in the recurrence rate in proportion to the extent and spread of the disease prior to operation.

DISCHARGE FROM NIPPLES

The returns showed that discharge was absent in 80.8 per cent. of the total cases; discharge was present in 9.6 per cent.; no information was given in 9.6 per cent.

NATURE OF OPERATION

The number of operations returned was 1,263, of which 89.2 per cent. were of the complete kind and 10.8 per cent. of the incomplete kind. In many of the cases the incomplete operation had to be performed owing to the advanced and widespread nature of the disease. Of the operations 67 per cent. were performed in hospitals, 31 per cent. in nursing homes, and 2 per cent. in private houses.

Of the 971 operations (married and single) followed by survival at the time of reporting 882 were of the complete type and 89 of the incomplete type. The survival rate for four or more years and the recurrence rate in the two types are shown in Table XVIII.

TABLE XVIII

Type of Operation	Survivals for Four or More Years in Good Health after Operation	Recurrences after Operation
	Per cent.	Per cent.
Complete	28.8	18.8
Incomplete	13.4	39.4

This table shows the marked superiority of the complete over the incomplete operation as regards the after-results.

MICROSCOPICAL EXAMINATION OF GROWTHS

The results of the microscopical examinations were given in 696 cases. These were classified into the following four groups:

1. *Scirrhus*.—This group includes those described as "scirrhus" and "definitely malignant."
2. *Medullary*.—This group includes those described as "spheroidal-celled," "encephaloid," "colloid," "adenocarcinoma," and "glandular-celled."
3. *Carcinoma*.—This group consists of those simply described as "carcinoma."
4. *Duct-cancer*.—This group includes those described as "columnar" and "papillary in ducts."

Among the 696 cases scirrhus occurred in 37.8 per cent. of the cases; medullary in 33.9 per cent.; carcinoma in 22.7 per cent.; duct-cancer in 5.6 per cent.

Owing to the collection of such a number of cases in which reliable microscopical examinations had been made it appeared that it might be of interest to contrast in the four groups (a) the survival rates for four or more years in good health and the recurrence rates, (b) the relative proportions of the four types in those that suckled their children and in those that did not, (c) the relative age incidence, (d) the relative proportions of the four types according to the stage of the disease (see p. 899), (e) the relationship of pain to the four types. The results are given in Tables XIX-XXIII.

TABLE XIX

Type of Growth	Survivals for Four or More Years in Good Health after Operation	Recurrences after Operation
	Per cent.	Per cent.
Scirrhus	31.4	16.2
Medullary	27.2	20.4
Carcinoma	33.6	14.9
Duct-cancer	35.1	10.8

This table shows that the survival period for four or more years is lowest in the medullary type, and that recurrences are much less frequent in the duct type and are more common in the medullary type.

TABLE XX

Type of Growth	Those that Suckled	Those that did not Suckle
	Per cent.	Per cent.
Scirrhus	35.7	41.9
Medullary	30.8	32.6
Carcinoma	24.4	23.2
Duct-cancer	8.1	2.3

This table shows that the proportion of duct-cancer is much higher in those that suckled than in those that did not. If suckling has any influence on the development of cancer of the breast the above figures would tend to show that it is rather more prone to produce the duct type, but as the number of women who did not suckle is small, no very reliable deduction on this point can be drawn from the returns of this inquiry.

TABLE XXI

Type of Growth	Under 50 Years of Age	50 Years and Over
	Per cent.	Per cent.
Scirrhus	28.6	71.4
Medullary	44.1	55.3
Carcinoma	41.7	58.3
Duct-cancer	41.4	55.6

This table shows that under 50 years of age scirrhus is the least common type, but that over 50 years of age it is the most common type of cancer of the breast.

TABLE XXII.—*The Four Types in Relation to the Stage of the Disease*

Type of Growth	Class A	Class B	Class C
	Per cent.	Per cent.	Per cent.
Scirrhus	46.7	50.0	3.3
Medullary	45.6	49.1	4.3
Carcinoma	48.9	48.9	2.2
Duct-cancer	51.3	48.7	0.0

This table shows that the numbers of cases in the A and B groups were approximately the same for the four types. No cases of duct-cancer were in the C group.

TABLE XXIII

Type of Growth	Pain Present	Pain Absent
	Per cent.	Per cent.
Scirrhus	40.0	60.0
Medullary	28.0	72.0
Carcinoma	39.2	60.8
Duct-cancer	33.3	66.7

This table shows that the absence of pain is more marked in cases of the medullary type than in the other types. In the great majority of all the cases the pain was not of a severe character.

Among the returns of deaths after operation the results of the microscopical examination of the growths were given in 151 cases, and Table XXIV shows the relative mortality in the four types.

TABLE XXIV

Type of Growth	Mortality
	Per cent.
Scirrhus	35.4
Medullary	48.3
Carcinoma	14.6
Duct-cancer	0.7

This table shows that the death rate is much the highest in cases of the medullary type, and is extremely low in cases of the duct type.

All the figures in this section show that cancer of the medullary type is the severest form of the disease.

HISTORY AFTER OPERATION OF ALL PATIENTS ALIVE AT THE TIME OF REPORTING

Information was given in 969 cases as follows:

Survival after operation in good health at time of reporting	Under 4 years	51.9%
	4 years and over	27.4%
Recurrences after operation		20.7%

It is unfortunate in connexion with this inquiry that of the survivals after operation there are so many cases that had been under observation for less than four years at the time of reporting, since it is highly probable that many of them, if they had been kept under more prolonged observation, would have passed into the other group of four years and over. As mentioned in the early part of this report it must be carefully kept in mind that though the number of survivals for four years and over does not represent the number which would have been reached if all the cases had been kept under observation for a longer period, yet the actual number of cases has been of great value in comparing the survival rates under different conditions.

Secondary Deposits (Recurrences) after Operation

Information was given in 504 cases as to the times of occurrence after operation of the secondary deposits, and the results are shown in Table XXV.

TABLE XXV

Time of Occurrence of Secondaries after Operation	Percentage
Under 1 year	43.0
1-2 years	25.0
Over 2 years	32.0

Sites of Secondary Deposits

Information was given in 466 cases of the sites of the secondary deposits after operation; 227 occurred in a single site and 239 in multiple sites. Table XXVI shows the percentages of the respective sites among the 227 single recurrences.

TABLE XXVI

Site	Percentage
Axilla	5.7
Other breast	7.0
Supraclavicular glands	12.4
Skin	16.3
Within abdomen	22.9
Within chest	35.7

The multiple deposits occurred in two or more of the following sites: skin; supraclavicular glands; within chest; within abdomen; other breast; bones; spine and brain.

DEATHS AFTER OPERATION

No attempt can be made from the returns to calculate the post-operative mortality of cancer of the breast, as the number of deaths returned merely represent the deaths that came under the notice of the practitioners making the returns during the period from October, 1929, to September, 1930, and therefore bear no actual relation to the total returns.

It was thought desirable to ascertain the relative mortality rates during the different periods that elapsed between operation and death. Information on this point was given in 275 cases (married and single), and the results are shown in Table XXVII.

TABLE XXVII

Time of Occurrence of Death after Operation	Percentage of all Deaths
Under 1 year	27.6
1-3 years	46.2
3-6 years	18.6
Over 6 years	7.6

This table shows that practically three-fourths of the deaths occur within three years of operation.

INOPERABLE CASES

The total number of inoperable cases returned was 133. The reasons given for their being inoperable are shown in Table XXVIII.

TABLE XXVIII

Reasons for being inoperable	Percentage
Disease too advanced or too widespread	65.4
Advanced age	17.3
Cardiac disease	6.0
Lung disease	5.2
Cirrhosis of liver and ascites	0.8
Thyroid disease	0.8
Kidney disease	0.8
No reason given	3.7

TREATMENT BY X RAYS AND RADIUM

Reports were sent in of 302 cases that received x -ray treatment and of 173 cases that received radium treatment. As the methods of administration, the dosage, the number, and the duration of the treatments were not given in several of the cases, classification on those lines was impossible. The particulars have been classified in the following groups.

X Rays Employed after Operation as a Prophylactic Measure

This treatment was used in 235 cases.

TABLE XXIX.—*X Rays as a Prophylactic*

Time of Commencement of Treatment after Operation	No. of Cases	Percentage
Within 1 month	81	34.0
1-3 months... ..	93	39.6
3-6 months	10	4.3
Over 6 months	5	2.1
Not stated	47	20.0

Several of the cases were under observation after the treatment for only a comparatively short time at the date of reporting, but the results for all the cases are given in Table XXX.

TABLE XXX

Results	No. of Cases	Percentage
Survivals in good health at time of reporting—		
Under 1 year	22	9.3
1-4 years... ..	59	25.1
Over 4 years	49	20.9
Extension of growth to other parts	36	15.3
Deaths	69	29.4

X Rays Employed after Operation for Treatment of Secondary Growths

This treatment was used in 67 cases.

TABLE XXXI.—*X Rays for Treatment of Secondaries*

Time of Commencement of Treatment after Operation	No. of Cases	Percentage
Under 1 year	36	53.7
1-2 years	18	26.9
2-4 years	8	11.9
4-6 years	5	7.5

Some of the cases were under observation after the treatment for only a comparatively short time at the date of reporting, but the results for all the cases are given in Table XXXII.

TABLE XXXII

Results	No. of Cases	Percentage
Apparent cure at time of reporting—		
Under 1 year	3	4.5
1-4 years... ..	7	10.4
Over 4 years	2	3.0
Secondary growth kept in check	8	12.0
Extension of growth to other parts	18	26.8
Deaths	29	43.3

As regards the four types of cancer (see p. 900) and their reaction to x rays, there is very little difference in the relative results in the four types of the employment of x rays after operation, both for prophylactic treatment and for treatment of secondaries.

Comment is made later on as to the comparative values of x -ray and radium treatment after operation, as deduced from the returns of this inquiry.

Radium Employed after Operation as a Prophylactic Measure

This treatment was used in 52 cases. Needles or tubes were used in 80 per cent. of the cases, surface treatment in 13 per cent., and seeds in 7 per cent.

TABLE XXXIII.—*Radium as a Prophylactic*

Time of Employment of Radium	No. of Cases	Percentage
At time of operation	35	69.2
Within 3 months of operation	13	25.0
Over 3 months after operation	3	5.8

The majority of the cases were under observation after the treatment for only a comparatively short time at the date of reporting, but the results for all the cases are given in Table XXXIV.

TABLE XXXIV

Results	No. of Cases	Percentage
Survivals in good health at time of reporting—		
Under 1 year	21	40.4
1-4 years	14	27.0
Over 4 years	4	7.7
Extension of growth to other parts	6	11.4
Deaths	7	13.5

Radium Employed after Operation for Treatment of Secondary Growths

This treatment was used in 52 cases.

TABLE XXXV.—*Radium for Treatment of Secondaries*

Time of Commencement of Treatment after Operation	No. of Cases	Percentage
Under 1 year	14	27.0
1-2 years	17	32.6
2-4 years	7	13.4
4-9 years	14	27.0

Several of the cases were under observation after the treatment for only a comparatively short time at the date of reporting, but the results for all the cases are given in Table XXXVI.

TABLE XXXVI

Results	No. of Cases	Percentage
Apparent cure at time of reporting—		
Under 1 year	10	19.2
1-4 years	8	15.4
Secondary growth kept in check	5	9.6
Extension of growth to other parts	18	34.6
Deaths	11	21.2

So far as any deductions can be drawn from so small a number of cases (104 in all) it would appear that radium is of greater benefit as a prophylactic agent than for the treatment of secondary growths.

As regards the four types of cancer (see p. 900) and their reaction to radium, the worst results, as shown by the extension of the disease to other parts, were obtained in the medullary type.

Comparison of the Results of Prophylactic Treatment

Table XXXVII shows the survival and recurrence rates among (a) the cases that had no prophylactic treatment after operation, (b) the cases that had x -ray prophylactic treatment after operation, and (c) the cases that had radium prophylactic treatment after operation. For the purposes of this table all the survivals in good health at

the date of reporting are made use of. The periods during which they had been under observation varied from a few months to several years, but the average periods were practically the same in the three groups.

TABLE XXXVII

	No. of Cases	Survivals in Good Health		Recurrences	
		No. of Cases	Per-centage	No. of Cases	Per-centage
(a) No prophylactic treatment after operation	758	599	79.0	159	21.0
(b) X-ray prophylactic treatment after operation	165	130	78.3	36	21.7
(c) Radium prophylactic treatment after operation	45	39	86.7	6	13.3

This table shows that x-ray prophylactic treatment after operation is apparently useless, since the survival and recurrence rates are practically the same as in the cases that had no prophylactic treatment. On the other hand, it shows the beneficial effects of radium prophylactic treatment after operation as represented by the higher survival rate and the lower recurrence rate, although it must be borne in mind that the number of radium cases is a small one from which to draw reliable deductions.

RADIUM TREATMENT WITHOUT OPERATION

This treatment was used in 69 cases. Radium needles were employed in 48 cases, radon seeds in 13 cases, and surface application in 8 cases. No useful deductions can be drawn from so small a number of cases, especially as they had been under observation for only comparatively short periods at the time of reporting.

BRIEF SUMMARY OF RESULTS

1. The liability to cancer of the breast is not increased by the production of a large number of children. The results of this investigation tend to show that the greater the number of children the less is the liability to cancer of the breast.

2. A relatively higher proportion of cancer of the breast occurs in non-parous married women and in single women than in parous married women.

3. Fertility and non-fertility of women appear to have no influence on the after-operation results, as shown by the survival rate and the recurrence rate.

4. A painless lump was the first symptom that directed the patient's attention to the breast condition in 79.5 per cent. of the cases; a painful lump in 8.7 per cent.; and pain alone in 5.1 per cent.

5. The longer the interval of time allowed to elapse between the first recognition of the disease and operation the worse is the result, as shown by the survival rate, the recurrence rate, and the mortality rate.

6. Preceding breast troubles (injury, mastitis, abscess, sore nipple, and Paget's disease) do not appear to be a factor of much importance in the development of cancer of the breast.

7. Pain was completely absent in two-thirds of the cases, and was not of a severe character in the great majority of the remaining cases.

8. From the results of this investigation it would appear that the influence of hereditary predisposition on the causation of cancer of the breast is not a dominant factor. Only 23.1 per cent. of the patients gave a family history of cancer.

9. There is a marked decrease in the survival rate and a marked increase in the recurrence rate after operation in proportion to the extent and spread of the disease prior to operation.

10. The figures in this report show the marked superiority of the complete over the incomplete operation as regards the after-results.

11. The statistics in connexion with the four types of cancer indicate that the medullary type is the severest form of the disease, as shown by that type having the lowest survival rate, the highest recurrence rate, and the highest death rate.

12. Under 50 years of age scirrhus is the least common type, and over 50 years of age it is the most common type of cancer of the breast.

13. Prophylactic treatment with x rays after operation is apparently useless.

14. Prophylactic treatment with radium after operation exercises a beneficial effect, as represented by the higher survival rate and the lower recurrence rate, as compared with the post-operative cases that either had no prophylactic treatment or received prophylactic treatment with x rays. This deduction as to the value of prophylactic treatment with radium is, however, drawn from only 45 cases.

LONDON PUBLIC HEALTH SERVICES

FIRST YEAR OF UNIFIED HOSPITAL CONTROL

London citizens are sometimes accused of lack of civic pride, and it is perhaps true that metropolitan boroughs are not always able to evoke a great exhibition of loyal feeling amongst those who live there. But the entire London, a county of more than a hundred square miles, existing under the largest local government authority in the world, is certainly more inspiring. Though up to the middle of the last century the government of London was mediaeval, to-day its County Council, despite possible criticisms of this or that part of its administration, is the envy of other capitals. To take only one aspect, the magnitude of its activities in public health—as disclosed in the recently published second volume of the Annual Report of the Council for 1930¹—is impressive. Owing to the Local Government Act of the previous year, 1930 was a specially interesting period in the Council's work, because of the large number of hospitals and ancillary services which passed under its unified control after having grown up under independent authorities.

TRANSFERRED HOSPITALS

The new Central Public Health Committee of the Council, consisting of twenty-six members, eight of them co-opted, began its work at the end of 1929. Up to the present it has had only one chairman, Dr. Florence Barrie Lambert. The hospitals transferred to its control from the Metropolitan Asylums Board number thirty-three, with accommodation for 14,000 patients, and from the boards of guardians forty-one, with accommodation for 27,000. From the moment it accepted the control of these institutions the committee began a programme of enlargement, and it still has considerable schemes of extension on hand. A pleasing feature of the new regime is the fact that each hospital has its committee, meeting at least once a month, and that by means of these local committees, together with a certain number of central subcommittees, the services of some 400 men and women, most of whom were members of the old authorities, have been retained. That this old wine should have been successfully rebottled is a good thing, for it must not be supposed that the Metropolitan Asylums Board, or even the boards of guardians, perished because they were inefficient: the public spirit and experience of their members is well worth preserving.

Besides bearing the responsibilities imposed by recent legislation, the Council undertakes a multitude of other health services by virtue of successive Acts and Orders. These include the public provision of treatment for tuberculosis, arrangements for the diagnosis and treatment of venereal diseases, milk inspection, infant life protection,

¹ London County Council Annual Report, 1930. Vol. ii. P. S. King and Son. (1s.)