

# THE ORIGIN AND EARLY HISTORY OF THE IMPERIAL CANCER RESEARCH FUND

A lecture given to the Staff of the Fund  
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by

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FUTURE HISTORIANS OF the Fund will no doubt divide its history into four chapters, the first covering the period when the research laboratories were adjacent to the old conjoint examination hall on Victoria Embankment, the second when they occupied the fourth and fifth floors of the examination hall in Queen Square, the third beginning with the move to Mill Hill and the fourth beginning with the opening of the research institute here in Lincoln's Inn Fields. To-day I shall tell the story of the first two chapters only, covering the period 1902–1912 when the laboratories were on the embankment and 1913–1938 in Queen Square, Bloomsbury.

Before explaining the origin of the Fund, let me first remind you that all cancer research institutes are products of the 20th century. Before this much valuable cancer research was carried out at hospitals, some of which, such as the Middlesex Hospital in London, had special cancer research departments, but a research *institute* differs from a research *department* of a hospital in that it is an independent institution directed primarily to basic problems in the causation and treatment of cancer. The Imperial Cancer Research Fund was the first such institution in this country.

## **Title of Fund**

What is now known as the Imperial Cancer Research Fund was founded on 4th July 1902. At first the adjective “Imperial” was not included in the title, which was simply the Cancer Research Scheme. Then, after the scheme took shape in 1902, it became known as The Cancer Research Fund. It achieved “Imperial” status only after the second general committee meeting on 8th July 1904.

At this meeting the chair was taken by the Prince of Wales (later King George V), he being the first President. At the close of this public meeting His Royal Highness, when replying to a vote of thanks, congratulated the committee on what had been accomplished so far and announced that, with the consent of His Majesty the King (Edward VII), the Cancer Research Fund would in future be known as the *Imperial* Cancer Research Fund.

The adjective "Imperial" no doubt had considerable prestige value in 1904, but this has lessened with the passage of time. Looking back now I am inclined to think that the word "Imperial" has been more trouble than it was worth! The original simple title "Cancer Research Fund" seems more realistic, less pretentious and certainly easier to remember. "Easy to remember" is an important consideration in relation to legacies. Unless these are worded correctly they may give rise to squabbles and litigation and such disputes have much increased since the inauguration of the British Empire Cancer Campaign in 1923.

### **Origin and foundation of Fund**

To return to the origin of the Fund: the idea of founding a cancer research fund seems to have originated in a chance conversation between Mr. Henry Morris, F.R.C.S., a member of the Council of the Royal College of Surgeons, and an "anonymous gentleman" who anticipated that through his influence in the City of London he would be able to raise at least £100,000 in a short time.

Encouraged by this, Henry Morris called together a preliminary meeting to discuss the proposal. This was held at his home, 8 Cavendish Square, early in 1901. Here it was decided that the object should be "the investigation of the cause, nature and treatment of cancer", and that the Royal College of Physicians and Royal College of Surgeons should be approached with the request that they would take control of the investigations. This the Royal Colleges subsequently consented to do, on the understanding that the money would be forthcoming without any appeal for funds being made by them. Agreement was reached with regard to this and a letter announcing the undertaking was printed in *The Times* (19th April 1902). The scheme was officially approved by the Royal Colleges on 4th July 1902. This is accepted as the foundation date.

Meanwhile, the "anonymous gentleman" previously referred to had become seriously ill and his death followed before he had been able to bring the matter to the notice of his friends. However, the first donation of £1,000 had already been made by a Mr. Charles Bell, who, as early as October 1901, as soon as the plan was prepared, came forward with this promise of help. Other substantial sums were either promised or donated during the next few months and it was clear that there would be sufficient financial support for the undertaking from charitable sources.

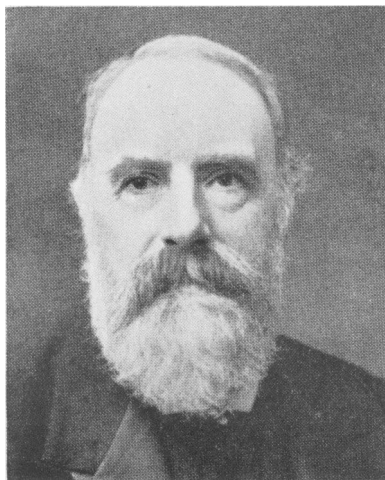
### **Early organization**

After the official approval by the Royal Colleges on 4th July 1902 the next step was to form an executive committee, and this was elected at a general meeting held on 25th July 1902 and met for the first time on 30th July at 62 Harley Street, the home of Mr. John Langton, F.R.C.S. At this meeting Sir William Church was elected Chairman, Mr. Henry Morris,

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Treasurer, and Mr. Frederick Hallett, Secretary. These three were chiefly responsible for the organization of the Fund in its early years.

Sir William Church, Bt., K.C.B. (1837–1928), was President of the Royal College of Physicians in the year the Fund was founded. He held the responsible post of chairman of the executive committee of the Fund for 22 years and throughout this long period seldom missed a meeting (Fig. 1).



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Fig. 1. Sir William Church, Bt., K.C.B., Chairman of the executive committee of the Fund from 1902 to 1924. (Portrait from Wellcome Historical Medical Library.)

Henry Morris (1844–1926) was treasurer for the first nine years. He was elected President of the Royal College of Surgeons in 1906 and became a Baronet in 1909 (Fig. 2).

It is of interest to recall that in the year following the foundation of the Fund, Henry Morris was appointed to give the Bradshaw Lecture to the Royal College of Surgeons and chose as his subject “Cancer and its Origin” (*Lancet*, 1903, 2, 1633). He began by recalling that the two Royal Colleges had recently undertaken the direction of what he described as “a national movement for the investigation of cancer”, and for this reason decided to review the general position at the beginning of this new undertaking.

At this time (1902), he said, the theory of the microbic origin of cancer “still occupied the forefront of cancer research”, but he pointed out that support for this was on the wane and that in his opinion there was no satisfactory evidence that cancer was caused by any known microbe or

fungus. He recalled the recent experimental work of Jensen and Borrel, which proved that tumours in animals could be transmitted by grafting and direct inoculation. In such experiments, he thought, it was not necessary to postulate any microbic cause.

He expressed himself as satisfied with the theory that tumours originate from a matrix of embryonic cells which during foetal life are cut off from their proper connections and remain in an undeveloped state. He referred to this as the "Tumour Germ Theory"—but of course he was describing what we now call Cohnheim's "hypothesis of embryonic rests".



Fig. 2. Sir Henry Morris, Bt., Treasurer of the Fund from 1902 to 1911. (From oil painting at the Royal College of Surgeons of England.)

These, then, were the views concerning the cause of cancer held by Henry Morris, a surgeon who had been in charge of the cancer department of the Middlesex Hospital for more than 20 years and who has the best claim to be regarded as the originator of the idea of the Cancer Research Fund.

The first secretary of the Fund was Frederick Hallett (1860–1933) (later Sir Frederick Hallett). He had been secretary of the Conjoint Examination Board since 1887. He attended the first executive committee of the Fund and was appointed part-time secretary, a position which he retained for 31 years. When he resigned in 1933 on account of ill health the

executive committee expressed “ their deep appreciation of the way he had guided the Fund and of his far-sighted ability in drafting its constitution ”.

### **Laboratory accommodation near Conjoint Examination Hall on Victoria Embankment**

Two important tasks faced the newly appointed executive committee: first, the provision of laboratory accommodation and, secondly, the appointment of research staff. The first of these presented no difficulties because it was known that space was available near the Conjoint Examination Hall on Victoria Embankment.



*Photo kindly supplied by Mr. Le Fanu, Royal College of Surgeons.*

**Fig. 3.** Conjoint examination hall on Victoria Embankment (1886). The rooms subsequently occupied by the Fund were behind this building.

To explain this I must recall that for some years the Royal Colleges had maintained research laboratories in rooms adjacent to the old examination hall in Savoy Place on Victoria Embankment, but in 1901 they decided to discontinue this arrangement on the ground of expense and appointed a committee to ascertain whether the premises could be used for some research project not financially dependent on the two Royal Colleges. Mr. Henry Morris was a member of this committee and so was Sir William Church. This all happened just when the first steps were being taken to initiate the cancer research scheme. Here were suitable vacant premises and without further delay the Fund became the new tenants.

The accommodation provided for the Fund consisted at first of two rooms only, but, as the laboratory staff increased, further rooms were placed at the Fund's disposal. These were situated to the north of the

examination hall and were entered by a side entrance which no longer exists.

The old examination hall (Fig. 3) is now the property of the Institution of Electrical Engineers and there have, of course, been many structural alterations in the adjoining property, but in the summer of 1964 I visited the site in company with Mr. W. J. Dunn, a retired technician, who had begun nearly 60 years ago as a "lab boy" in these same laboratories. We were allowed to climb to the upper floors of the building now used by the Institution of Electrical Engineers and looking down from the roof in the direction of Savoy Hill we could see the actual rooms which 60 years ago were packed with cages of rats and mice. Now they are equally overcrowded with typists and telephones! Incidentally when W. J. Dunn was first appointed in 1906 as a "lab boy" his salary was 10s. a week, but after two years it was raised to 12s. a week.

### **Appointment of staff**

I have already mentioned that the newly appointed executive committee met for the first time on 30th July 1902 and at this meeting it was decided to advertise for a "Superintendent of Research" at a salary of £800 per annum. Twelve candidates applied for the post and a selection committee made a short list of five. These five were interviewed and each was asked to submit a scheme of research work to be undertaken if appointed. These schemes were considered by the sub-committee, which reported that Dr. E. F. Bashford was their first choice. In passing it is of interest to mention that the unsuccessful candidates included, amongst others, W. S. Lazarus Barlow and T. B. Strangeways.

Dr. E. F. Bashford (1873–1923), the successful candidate, was only 29 years of age (Fig. 4). He had had a distinguished academic career at Edinburgh University, followed by postgraduate experience in Germany. From this he returned to Edinburgh early in 1902 as assistant to Sir Thomas Fraser in the department of pharmacology.

Fortunately the scheme of research which Bashford submitted to the selection committee is still available because he published it six years later as an appendix to the Third Scientific Report of the Fund. This interesting document, dated 24th October 1902, was entitled "A draft of scheme for enquiring into the Nature, Cause, Prevention and Treatment of Cancer", and is a comprehensive survey of the cancer problem as it appeared at the turn of the century. It must have impressed the committee! It is of historical interest because it provided the plan for most of the research work carried out by Bashford and his colleagues for the first six years of the Fund's existence.

Immediately on his appointment Bashford informed the committee that he proposed to proceed to Germany to study the present position of the

investigation of cancer in that country and to endeavour to co-operate with other Continental countries in the adoption of better methods for the collection of statistics and topographical information. Here it may be pointed out that Bashford was a good linguist and during his period as Director represented the Fund most ably at many congresses and other meetings abroad. He became the acknowledged spokesman of Great Britain in the world of cancer research.

Bashford held the post of Director of the Research Laboratory from December 1902 to December 1914, when he resigned because of ill health. Nine years later he died suddenly from heart failure at the early age of 49.



Fig. 4. Dr. E. F. Bashford, Director of laboratories of Fund, 1902-1914.

Bashford is still remembered as the originator of the Bashford needle and for his numerous contributions to scientific journals on the zoological distribution of cancer, the transplantability of animal tumours and induced resistance to them. I must mention also his journalistic skill in the preparation of the first series of Scientific Reports of the Fund. These constitute the most important contribution to the literature of cancer research from this country during the first decade of this century.

### **Scientific and Annual Reports**

The first Scientific Report was published in 1904 and dealt with the zoological distribution of cancer and the histopathology of cancer in different animals. The Second Report, published the following year, was divided into two sections, the first concerned with the statistics of cancer and the second with the growth of cancer under natural and experimental conditions. This, like all the early publications of the Fund, was lavishly and beautifully illustrated with line drawings.

The Third Scientific Report, issued in 1908, is a fat and heavy volume of more than 400 pages containing reprints of several published papers by members of the staff, together with a bibliography of all scientific communications from the laboratory of the Fund. Two more Scientific Reports were issued whilst Bashford was Director: No. 4 in 1911 and No. 5 in 1912.

In addition to these special Scientific Reports Bashford wrote each year an account of the work currently in progress for each of the Annual Reports of the Fund. These are of additional interest because they show that he could write clearly and forcibly for the lay reader as well as for the scientist. Here are two examples taken from the Third Annual Report (dated 1905). After pointing out that the experimental propagation of a malignant tumour is a manifestation of apparently unlimited growth he continued: "Under artificial propagation a mouse tumour has produced an amount of tissue sufficient to yield a giant mouse as large as a St. Bernard dog or several thousand adult mice" (page 8). Another quotation: "Cancer can only be transmitted experimentally by the continued growth of the tumour of one animal in another animal of the same species. . . . The tissues of the new host do not acquire cancerous properties. . . . No analogy exists between cancer and any known form of infectious or contagious disease" (page 9).

These forthright statements were necessary because the previous year the Post Office authorities had declared that "as cancer is an infectious disease the transmission of specimens was dangerous both to the public and to postal officials". This unwillingness to allow fragments of tumour tissue to be transmitted by post had interfered with a research undertaken to collect information concerning the geographical distribution of cancer.

I consider the Fund was fortunate in having as its first Director of the Laboratories a man who was not only a good organizer and successful research worker but also gifted both as a speaker and writer.

### **Other members of scientific staff in Embankment laboratories**

Within three months of his appointment as Director Bashford asked for an assistant to help him in laboratory work and Dr. J. A. Murray (1873–1950) was immediately appointed, at first at a salary of £200 a year (Fig. 5). In 1906 this was raised to £400 and in 1912 to £600 per annum.

Murray was the same age as Bashford and they had been fellow students at Edinburgh. Also, they had met when engaged in postgraduate work in Germany, so were well acquainted. For many years they worked well together, though very dissimilar in character.

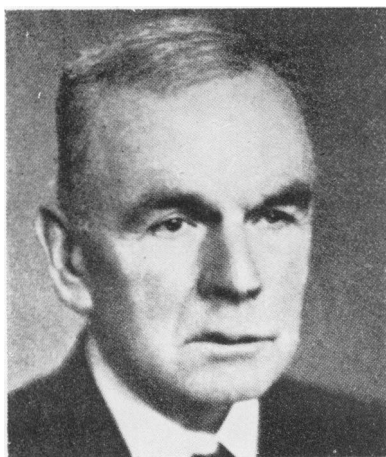
When Murray first joined the Fund in 1903 he published a number of papers on histopathology. By 1909 he had analysed the growth characteristics of more than 70 malignant new growths in animals and provided convincing evidence that the malignant cells in a tumour transplanted to a new host are the direct descendants of the injected cells, whereas the supporting tissue is derived from the host. The examination of all these tumours, together with countless spontaneous tumours from animals and man, gave Murray an unrivalled knowledge of the histology of malignant growths.

In the period before the first world war one of Murray's most important contributions to cancer research was his discovery that, in female mice with an immediate cancerous ancestry, breast carcinoma is more than twice as



frequent as in mice without such a history. This led to many investigations into mouse genetics which were continued when the research laboratories subsequently moved to Queen Square.

The third member of the Scientific Staff was Dr. W. Cramer, who was appointed in 1904 but left the following year to take up an appointment in the physiology department of Edinburgh University. His departure was much regretted by Bashford and Murray especially because they were not able to find any successor to carry out the chemical investigations which Cramer had commenced. Whilst speaking of Cramer I must mention that he returned to London in 1915 and after this continued on



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Fig. 5. Dr. J. A. Murray, F.R.S., appointed to scientific staff in 1903, Director of laboratory of Fund from 1914 to 1935. (From Wellcome Historical Medical Library.)

the Scientific Staff of the Fund until his retirement in 1939. He was always held in high esteem by his colleagues.

The year after Dr. Cramer's departure in 1905 Dr. Magnus Haaland and Mr. W. H. Bowen were appointed to the staff, and two years later Dr. B. R. G. Russell. In his annual report for 1909 the Director reported that now the staff had grown to four official assistants, six voluntary scientific workers and a staff of 14 laboratory technicians (Fig. 6). The Fund now occupied all the rooms available and began to be cramped for space, though in the meantime additional accommodation had been found in a farm near Cuffley where animals suffering from cancer might be kept under observation.

### **Move to Queen Square**

In 1908 the Royal Colleges sold the old examination hall on the Embankment and began to make arrangements for the building of a new examina-

tion hall in Queen Square, Bloomsbury. When this was completed in 1912 accommodation was once more provided for the Fund, rooms on the fourth and fifth floors of the new building being fitted up as research laboratories.

At first the Royal Colleges granted the Fund a lease of 21 years and this was subsequently extended for another seven years, but before the expiry of this lease the Fund moved in 1938 to Mill Hill.

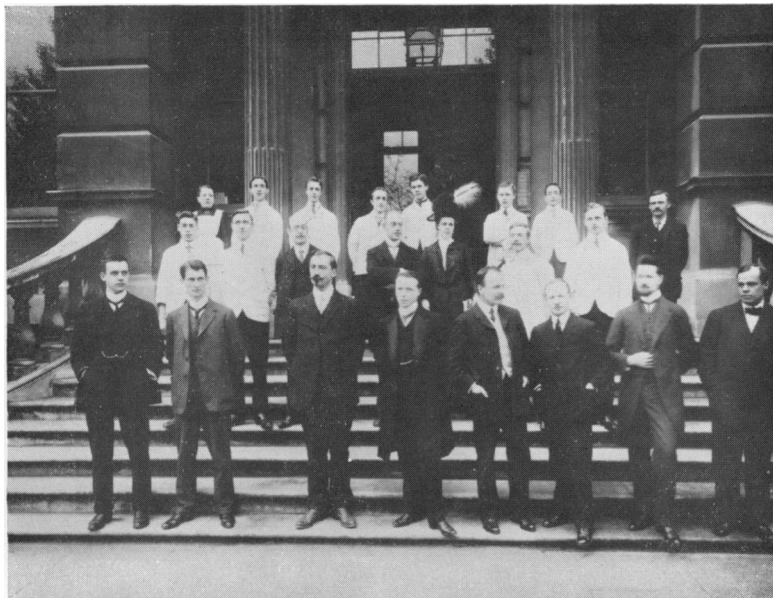


Fig. 6. Group picture of staff of research laboratory taken on steps of the examination hall in 1909. *Left to right:* Back row: Mrs. Tuohy, W. J. Dunn, H. L. Smith, C. Trott, H. Thatford, L. Sawyer, A. Storey, A. J. Sheene. Centre row: W. J. Milton, R. G. Miller, M. Finerty, F. G. Hallett, Miss Anderson, A. J. Hall, A. Chapman. Front row: W. H. Bowen, B. R. G. Russell, M. Haaland, E. F. Bashford, J. A. Murray, C. Da Fano, F. Medigrazianu, W. H. Woglom.

### 1912–1938

Thus throughout the long period covered by the years 1912 to 1938 the main research laboratories of the Fund were in the top two floors of the Conjoint Examination Hall in Queen Square, Bloomsbury. The fourth floor was divided by partitions, so providing separate rooms for some of the scientific staff. The fifth floor housed the experimental animals. I visited the premises in company with the former technician, Mr. Dunn, a few weeks ago and we found that on the fourth floor the partitions have been removed, converting this into one big examination room provided

with writing desks for candidates, but the fifth floor is much as it was when occupied by the Fund. There have, however, been some alterations because, since the departure of the staff of the Fund in 1938, part of the accommodation has been let to the Medical Research Council and more recently to the Pharmacology Department of the Royal College of Surgeons.

For most of the time the Fund's laboratories were at Queen Square the Director was Dr. J. A. Murray with Dr. Cramer as senior member of his scientific staff. At various times the following also worked in these laboratories: Drs. B. R. G. Russell, W. E. Gye (who succeeded Murray as Director in 1935), G. H. Crabtree, A. M. Begg, A. H. Drew, G. M. Findlay, R. J. Ludford, L. Foulds, F. R. Selbie, A. F. Watson and R. Knox. In addition there were many visiting research workers from time to time.

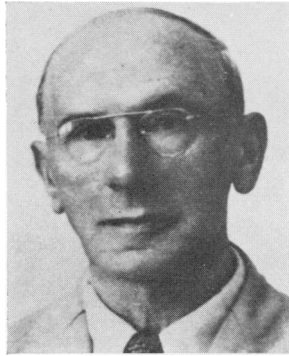
I shall not attempt a detailed description of all the research work carried out during the 26 years when the Fund's main laboratories were in the Examination Hall in Queen Square, but for information concerning this I would direct you to a pamphlet issued in April 1952, entitled *Fifty years of Cancer Research*. This was distributed as a supplement to the Forty-ninth Annual Report of the Fund. The name of the author is not mentioned, but Dr. James Craigie, F.R.S., was Director of the Fund's laboratory in 1952, and I do not think that anyone but he could have written such a detailed and authoritative summary of all research undertaken by the Fund during its first 50 years. I should like to pay my tribute now to this invaluable source of reference and will only add that I wish it were better known and more generally available.

Instead of attempting to summarize all the work carried out in the laboratories at Queen Square let me remind you of some of the new developments at other centres of cancer research during the period 1912 to 1938, because these influenced greatly the work planned by Murray and his staff.

The 26 years during which the chief laboratories of the Fund were in Queen Square was a period of expansion of cancer research in many different countries. First I must mention the discovery by Peyton Rous in 1911 at the Rockefeller Institute, New York, that a sarcoma of the domestic fowl could be propagated by cell-free filtrates. Though at first this did not arouse much interest the Fund decided in 1922 to undertake a study of the so-called infective sarcoma with a view to "defining the difference, if any, between these and true neoplasms". Meanwhile Gye had started an independent study of the Rous sarcoma whilst working for the Medical Research Council, and in 1925 he startled the world by announcing that he had discovered two factors in cancer, one being a virus and the other a specific factor which enabled the virus to infect.

Next year in the Annual Report of the Fund (23rd Annual Report for 1924-5) the Director (Dr. Murray) said that the outstanding event of the year was the publication of Gye's paper entitled "The Etiology of Malignant Growths". Gye had obtained the transplantable tumours with which he worked from the Fund's laboratories and he now requested Murray to undertake a critical repetition of his fundamental experiments. Thus began a new chapter in cancer research, to which so many important contributions have been made by members of the Scientific Staff of the Fund, especially after Gye himself became Director in 1935 (Fig. 7).

During the first world war, in the years 1915 and 1918, reports reached this country from Japan claiming that cancer of the skin could be produced in experimental animals by the repeated application of tar. Soon after the termination of the war this was confirmed by Murray in the



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Fig. 7. Dr. W. E. Gye, F.R.S., Director of research laboratories of Fund from 1935 to 1949. (From Wellcome Historical Medical Library.)

Fund's laboratory and thus began a series of experiments designed to study this new method of producing cancer experimentally.

Then in 1923 Warburg from Berlin announced what appeared at first to be a fundamental discovery because it seemed to reveal a clear-cut metabolic difference between normal and cancer cells. Two members of the staff of the Fund visited Warburg's laboratory and on their return initiated a new programme of research concerned with cell metabolism.

One of the great landmarks in the history of cancer research was the work of Kennaway and his colleagues at the Chester Beatty Research Institute, which culminated in 1930 in the preparation of the first chemically pure carcinogens. The discovery and synthesis of chemical substances which will produce cancer had a profound influence on the course of cancer research. It demonstrated for the first time that malignant tumours exactly akin to human cancer could be induced by the application

to animals of pure chemical compounds of known molecular structure. It stimulated much new work in the Fund's laboratory to elucidate the nature of chemical carcinogenesis.

Looking back now we see that another notable event was the discovery by Lacassagne in 1932 that in male mice cancer of the breast might follow the injection of oestrogenic hormones. This became the starting point of new researches undertaken chiefly by Cramer and Horning directed to measure the influence of hormones, both in the initiation and control of neoplasia. This also is a chapter in which much remains to be written.

Finally, one other major discovery made in another research institute was the discovery by Shope in 1933 of a virus in a tumour of the cotton-tail rabbit. This became of special interest when it was discovered that if the virus was injected intravenously into rabbits whose ears had been painted with tar the virus became localized in the treated skin, producing malignant growths. To study the obscure relationship between the virus and carcinogenic chemicals a new series of experiments was planned in the Fund's laboratories.

I have mentioned some of the most important developments of cancer research during the period when the Fund's laboratories were in Queen Square and explained how they were followed up by the scientific staff of the Fund. This method of recalling the history of these 26 years against the background of contemporary events may have resulted in the omission of reference to other important work undertaken in the laboratories in Queen Square during this period, but, as I have already said, a full and detailed review of this is already available in the pamphlet issued by the Fund entitled *Fifty years of Cancer Research*. So though my way of looking at what was accomplished in the laboratories in Queen Square is necessarily incomplete, it has the advantage of emphasizing the manner in which Dr. Murray and his scientific staff became the court of appeal, so to speak, of cancer research during this period.

And it gives me an opportunity also, in conclusion, to draw attention to the degree to which the scientific staff of the Fund influenced the development of knowledge of the pathology of cancer, especially here in London, in the nineteen twenties and thirties.

In those days there were not so many scientific societies as there are to-day and the attendance at meetings was smaller and those who attended the meetings got to know each other personally. Murray, Cramer and Gye and other members of the scientific staff attended regularly at meetings of the Pathological Society and the Pathology section of the Royal Society of Medicine. From time to time they reported on their own researches, but of equal importance was that they took part in discussions and commented on the work of others.

Murray, Cramer, Gye, Ludford, Foulds and Horning were all friendly, approachable people whom it was easy to talk to, and I am sure that many young pathologists like myself came away from those meetings feeling they were well worth while because one had learnt something definite from them.

Let me recall again that this lecture deals only with the origin and early history of the Fund. The Fund is at present 62 years old. I have dealt only with the first 31 years of its existence. I hope someone else on some other occasion will take up the story where I have left it to-day, and record the history of the work at Mill Hill and later here at Lincoln's Inn Fields.

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