MEDICINE AND BIOMEDICAL SCIENCES IN MODERN HISTORY

GENDER AND CANCER IN ENGLAND, 1860-1948

ORNELLA MOSCUCCI

Medicine and Biomedical Sciences in Modern History

Series Editors

The aim of this series is to illuminate the development and impact of medicine and the biomedical sciences in the modern era. The series was founded by the late Professor John Pickstone, and its ambitions reflect his commitment to the integrated study of medicine, science and technology in their contexts. He repeatedly commented that it was a pity that the foundation discipline of the field, for which he popularized the acronym 'HSTM' (History of Science, Technology and Medicine) had been the history of science rather than the history of medicine. His point was that historians of science had too often focused just on scientific ideas and institutions, while historians of medicine always had to consider the understanding, management and meanings of diseases in their socio-economic, cultural, technological and political contexts. In the event, most of the books in the series dealt with medicine and the biomedical sciences, and the changed series title reflects this. However, as the new editors we share Professor Pickstone's enthusiasm for the integrated study of medicine, science and technology, encouraging studies on biomedical science, translational medicine, clinical practice, disease histories, medical technologies, medical specialisms and health policies. The books in this series will present medicine and biomedical science as crucial features of modern culture, analysing their economic, social and political aspects, while not neglecting their expert content and context. Our authors investigate the uses and consequences of technical knowledge, and how it shaped, and was shaped by, particular economic, social and political structures. In re-launching the Series, we hope to build on its strengths but extend its geographical range beyond Western Europe and North America. ***Medicine and Biomedical Sciences in Modern History*** is intended to supply analysis and stimulate debate. All books are based on searching historical study of topics which are important, not least because they cut across conventional academic boundaries. They should appeal not just to historians, nor just to medical practitioners, scientists and engineers, but to all who are interested in the place of medicine and biomedical sciences in modern history.

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CONTENTS

Abbreviations

AAGP	American Academy of General Practice
ACS	American Cancer Society
AJCC	American Joint Committee on Cancer
ASCC	American Society for the Control of Cancer
BCG	British Colposcopy Group
BECC	British Empire Cancer Campaign
BMA	British Medical Association
BMJ	British Medical Journal
CHEC	Central Health Education Council
FIGO	International Federation of Gynecology and Obstetrics
ICRF	Imperial Cancer Research Fund
LCC	London County Council
MAB	Metropolitan Asylums Board
MRC	Medical Research Council
MWF	Medical Women's Federation
NHS	National Health Service
NRC	National Radium Commission
NRT	National Radium Trust
RAMC	Royal Army Medical Corps
RCOG	Royal College of Obstetricians and Gynaecologists
RCS	Royal College of Surgeons
WFA	Women's Field Army

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CHAPTER 1

Introduction

In 2011 the charity Bowel Cancer UK carried out a survey asking people to name the top three cancers they thought themselves most at risk of. Three-quarters of the female interviewees named breast, cervical and ovarian cancer. The correct answer, based on cancer incidence statistics, would have been breast, lung and bowel cancer. Reporting on the results, the tabloid *Daily Mail* stated that women were ‘living in ignorance’ of bowel cancer.[1] Women’s perception of their cancer risk, this volume argues, is not the result of ‘ignorance’, but a reflection of the success of policies which, since the early 1900s, have consistently targeted women’s cancers as a major focus of medical and public health intervention. Indeed, it is no exaggeration to say that, in England and in many other Western countries, women’s cancers have played an outstanding role in positioning cancer in the public domain, thanks to cancer awareness campaigns, screening programmes, specialist charities and fundraising events.

The association of cancer and femininity has a long history in the medical literature. Historian James Olson emphasizes that, throughout history, breast cancer *was* cancer.[2] Cancer expert Walter H. Walshe, writing in 1844, stated that cancer was originally thought to be an affection peculiarly affecting the breast; as morbid states of a similar character were found to occur in other organs, they were included under the same general name.[3] Whether women were actually more prone to cancer than men throughout history is difficult to say. Edward Shorter has claimed

O. Moscucci, *Gender and Cancer in England, 1860–1948*,
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that, until the late nineteenth century, cancer was thought to be primarily a woman's disease because malignancies of the breast, cervix and other 'external' organs were the only ones that could be diagnosed.[4] There is some evidence to suggest that men succumbed to internal cancers more often, and that internal cancers were under-diagnosed. Aetiological explanations of cancer throughout history imply, however, that women are more susceptible to cancer because of some inherent design fault. Galen, for example, claimed that women's coldness made them prone to disease. Their blood, corrupted by humidity, instead of being properly heated like it was in men, accumulated, blocked up the small blood vessels and caused all the diseases of which they were habitual victims.[5] During the nineteenth century, the connection between cancer and women was cemented by the theory that women's bodies were defined by their sexual functions.[6] Women's liability to cancer of the uterus and breast served to confirm the view that reproduction had a much larger place, for good or evil, in the life of woman than in that of man. Indeed, according to sociologist Tammy Duerden Comeau, during this period the gendering of cancer extended to the articulation of cancer classifications and theories about cancer's origins. A model of cancerous disease emerged which emphasized its reproductive nature, as testified by the use of the term 'proliferative' to describe the behaviour of cancer cells.[7]

Studies of the medical, social and political response to cancer in the twentieth century have highlighted the centrality of gynaecological cancers to the early cancer campaigns, yet there is little historical work on this group of cancers. Furthermore, the bulk of historical attention has focused on American cancer programmes.[8] This volume joins a growing body of work that is beginning to redress the balance, illuminating the history of British and European cancer campaigns. Focusing on cervical and, to a lesser extent, on ovarian cancer, it examines the role this group of cancers has played in the creation of twentieth-century cancer campaigns in England. The focus on gynaecology allows not only an examination of the contribution made by gynaecologists themselves to the development of cancer control policies in this country, but also a study of the part played by others concerned with the gynaecological cancers: radiotherapists, pathologists, voluntary organizations, public health practitioners and government officials.

Cervical cancer occupies an especially important place in the history of British efforts against cancer as the target of the first awareness campaign in 1907 and the model for subsequent campaigns against skin, breast, oral and rectal cancer. The common feature of these very different malignancies is that they reveal themselves at a relatively early stage in the natural history of the disease. Early twentieth-century anti-cancer activists believed that this peculiarity made these cancers particularly suited to approaches based on 'early detection and treatment'. Yet even as the scope of the British campaign broadened during the 1910s to include cancers that were not gender-specific, much of the anti-cancer effort continued to be directed at women. It was not until the 1950s that men began to feature more prominently in public discourses about cancer, through the concern with lung cancer.[9] In its broad contours, the British story appears to resemble the US one. In the United States, too, cancer awareness campaigns began in the early 1910s in response to concerns about cervical cancer mortality. The original focus widened in the 1920s to include breast, oral, skin and stomach cancer, but women's reproductive cancers remained a major focus of public attention until the 1950s, when concerns about the increase of lung cancer, particularly in males over forty-five, brought about a change in the balance of the sexes, towards men. These apparent similarities mask underlying differences in the financial and structural basis of the healthcare system in each country, in patterns of specialization, and in broader cultural attitudes. These differences have shaped the development of treatment modalities, the provision of routine cancer treatment and the timing and tone of campaigns in each country. The British story thus deserves to be examined in its own right.

'Uterine' cancer (a term still used in the early 1900s to denote cancer of both the neck and body of the uterus) acquired public visibility in the early 1900s as a relatively hopeful malignancy. *Fin-de-siècle* optimism was based on the premise that the combination of early detection and 'radical' surgery (i.e., surgery aimed at eradicating the disease) would prove curative. The philosophy of surgical radicality, I show in Chap. 3, was not new. In the early decades of the nineteenth century, a few surgeons had attempted to develop radical surgical procedures for benign conditions such as hernia and ovarian cysts, as well as for malignant conditions such as cervical and breast cancer. Radical surgery was risky, but justifiable if it could permanently relieve the patient of a troublesome and potentially fatal disease. The problem with radical surgery for malignant disease was that it did not produce permanent cures. True cancer had a tendency to recur – and indeed, for most of the nineteenth century the notion of recurrence was integral to the definition of malignancy. In the first half of the nineteenth century concerns about the dangers and ineffectiveness of radical solutions for cancer prompted most medical writers to recommend that operative interference should be contemplated only as a last resort. Around the middle of the nineteenth century, however, the introduction of anaesthesia and the development of new techniques aimed at reducing the risks of surgery encouraged surgeons to offer operations more frequently and at an earlier stage of the disease. Further support for a more aggressive approach to the treatment of malignant disease came from a statistical study of the results of surgery for breast cancer at London's Middlesex Hospital, which showed that patients who were operated upon survived longer than those who did not have the surgery. Operations for cancer became increasingly extensive during the last quarter of the century, in the belief that recurrences were due to 'inadequate' excision of tissue. This strategy did not in fact work: by 1900 leading surgeons and gynaecologists privately admitted that even the most extensive surgery did not permanently eradicate the disease. Yet they continued to promote radical solutions for malignant disease, supported by a new narrative of therapeutic failure. Advocates for surgery asserted that a period of disease-free survival (the 'surgical cure') counted as a 'cure', and that surgery would be successful, if only patients would not delay seeking medical advice. Historians of medicine have emphasized the importance of the 'message of hope' in the war on cancer. Sociologists and anthropologists have drawn attention to the 'discourse on hope' in modern oncology, highlighting its significance at a number of levels: individual, interpersonal and institutional.[10] A considerable investment rests on hope, and hope has become synonymous with curative treatment – if not now, then sometime in the future. There is now a growing literature on the 'sociology of expectations', a strand of Science and Technology studies which deals with the role of expectations in shaping scientific and technological change.[11] Moreira and Palladino have discussed the tensions in modern biomedicine between a 'regime of hope' characterized by the view that new and better treatments are always about to come, and a 'regime of truth' based on the view that most medical therapies are, most often than not, less effective than claimed. This volume makes a contribution to this discussion by exploring how the aspirational discourse of hope came to be used by surgeons and gynaecologists as a means of legitimating operative interference, justifying further investment in a treatment that simply was not working as expected.

During the 1920s, developments in the application of X-rays and radium to the treatment of a range of malignancies raised new hopes that the 'cure of cancer' may be just around the corner. As I show in Chap. 5, cervical cancer proved to be particularly sensitive to the effects of radiation. Statistical studies undertaken in the late 1920s appeared to show that treatment by radium or X-rays relieved the symptoms of incurable cancer, and that it produced results comparable to those of surgery in operable cases. In addition, there was much evidence that radiation therapy was significantly safer than surgery. But enthusiasm for the radiation treatment of cervical cancer was also generated by the belief that it provided an alternative to 'mutilating' gynaecological surgery. Many doctors and public health officials claimed that fear of surgery and its consequences deterred women from seeking early medical advice. When the treatment was less drastic and hazardous it was easier to persuade women to consult the doctor. The development of radiotherapy of cervical cancer was thus also shaped by cultural beliefs about the effects of surgery when women's reproductive organs were involved.

Chapter 5 examines another aspect of the gendered politics of radiotherapy: the role medical women played in the standardization of radium treatment of cervical cancer. Radium therapy of cervical cancer was of interest to female practitioners for two main reasons. First, it confirmed their established role as providers of healthcare to their own sex. Women doctors had managed to find a niche in medicine as the guardians of the physical and moral health of women and children. Campaigners for women's entry to medicine had argued that women doctors were badly needed to preserve the modesty of women patients, especially in cases of gynaecological disease requiring intimate examinations. There was thus widespread agreement that patients suffering from cervical cancer would prefer to be treated by a female clinician. Second, radiotherapy provided an opportunity to further feminist efforts to reform medicine, both as a practice and as a profession. Its development opened up new career paths for women in an area of medicine which, though still marginal, already had a reputation for modernity and leading-edge technology. It was thus also attractive as a means of challenging the gender-role stereotypes which prevented girls and young women from pursuing opportunities in science.

In parallel with efforts to find women at an earlier stage in their personal history of cancer, another quest gathered momentum in the laboratory. Between approximately 1925 and 1945, methods aimed at detecting cervical cancer in its earliest, 'pre-cancerous' or 'non-invasive' stage were developed in Germany and in North America: the Schiller test, the colposcope and the Pap smear. After the Second World War these methods were used as the basis for mass screening programmes in the Americas.

In both Argentina and Brazil, the colposcope became the first screening method before the Pap smear, whereas in North America the Pap smear was adopted as the primary screen. Screening for cervical cancer was introduced into Britain much later than into either North or South America, reflecting doubts about the efficiency and cost-effectiveness of screening as a tool for disease control. This lack of enthusiasm for screening, I argue in Chap. 6, can partly explain why there was little interest in developing a British method of cytological diagnosis which had the potential to become an alternative to the Pap smear. In the interwar period Leonard Dudgeon, a pathologist at London's St Thomas' Hospital, introduced an intra-operative method of tumour diagnosis which showed great promise as a means of picking up early abnormalities of the cervix (and lungs) in patients attending the hospital's out-patient department. Yet there was no follow-through, and when the UK cervical cancer screening programme was finally rolled out, it was the Pap smear that was adopted as the primary screen.[12]

Efforts to control ovarian cancer took a different course. Ovarian cancer did not appear to fit the 'early detection and treatment' model. For much of the twentieth century it was generally regarded as a 'silent killer' which escaped early detection, either because it was asymptomatic, or because it presented with symptoms so vague that the disease was advanced in many cases by the time the woman sought care. Furthermore, even when caught relatively early, ovarian cancer had a much poorer prognosis than breast or cervical cancer. These factors supported the exclusion of ovarian cancer from public information campaigns and popular medical literature aimed at women. What emerged instead, beginning in the mid-1940s, was 'prophylactic oophorectomy', the practice of removing non-diseased ovaries in peri- and post-menopausal women undergoing hysterectomy for benign conditions. The use of oophorectomy as a strategy for the prevention of ovarian cancer has been the subject of much professional debate. Arguments against the practice have focused on its deleterious effects on women's health: increased risk of mortality from all causes, lung cancer, coronary heart disease, stroke, osteoporosis and bone fractures, cognitive impairment, Parkinsonism, psychiatric symptoms and impaired sexual function.[13] Arguments in favour have hinged on the estimated number of lives saved from ovarian cancer, in the absence of a proven screening method for the disease.[14] The use of preventive ablation as a means of reducing the danger of breast, uterine and ovarian malignancy has also attracted the attention of historians. In *Preventive Strikes*, Ilana Löwy argues that ‘mutilating’ preventive surgery has been directed mainly at women.[15] Löwy attributes the supposed gender imbalance both to the visibility of women’s cancers, and to the long tradition of surgical management of gynaecological problems. There is no doubt that prophylactic prostatectomy and orchidectomy are less common than prophylactic mastectomy, hysterectomy and oophorectomy, but this is only part of the story. The use of medical circumcision for the prevention of penile cancer, for example, dates back to the mid-nineteenth century. It was a routine practice in Britain until the 1950s, and it is still the most common surgical procedure performed in the United States. Prophylactic operations for people with a genetic risk for familial gastric or colon cancer are performed on both men and women. Outside the field of cancer, there is a long history of non-gender-specific surgery aimed at eliminating potential foci of infection in the body and controlling the spread of infection in the community (for example, adenoidectomy and tonsillectomy). Prophylactic cancer surgery on women thus needs more careful contextualization. In Chap. 7, I link the development of prophylactic surgery for women’s reproductive cancers with other preventive surgeries, and with circumcision for medical reasons. My account focuses on the dilemmas posed by the use of potentially hazardous procedures to treat the mere probability of disease. Anxieties about ‘mutilating’ surgery are an important strand of debates about the legitimacy of surgical intervention, particularly in cases where the surgery is performed to prevent a disease that may never develop. My analysis suggests that the definition of a given operation as ‘mutilation’ is always historically contingent, mirroring cultural variables that vary over time and across countries. Gender has produced differences in management of pre-cancerous conditions and cancer risk, but the mechanisms that have produced such differences are not the same.

As well as adding to the historical literature on gender and medicine, this volume makes a contribution to contemporary historical and public health debates about prevention. Both public health commentators and historians have claimed that programmes of cancer control have marginalized prevention.[16] In *Cancer Wars*, for example, historian Robert Proctor argues that

> prevention … has languished as a relatively minor part of the American cancer program … The effort to redefine treatment as simply another form of prevention leads one to wonder whether the cancer research bureaucracy is trying to do with words what it is unwilling or unable to do with deeds.[17]

This view reflects the position that therapeutic approaches to prevention do not count as 'true' prevention: only the prevention of lifestyle and environmental 'causes' does. The belief that prevention means 'preventing known causes' is by no means new. As I show in Chap. 4, academic physicians and surgeons in early twentieth-century England regularly claimed that cancer could not be prevented because its cause was not known. This narrow interpretation of prevention served to legitimate demands for funding and research into the 'cause' of cancer. For the majority of practitioners and public health doctors, however, preventing cancer *mortality* was a far more urgent issue than discovering the cause of cancer. They thus stressed not only the importance of eliminating any lifestyle or environmental factor that might predispose to the disease, but also the need to develop approaches based on 'early detection and treatment'. Since the 1950s attempts have been made to rationalize prevention by reconceptualizing it as a series of successive orders. Primary prevention seeks to prevent the onset of specific diseases via risk reduction (for example, by encouraging people to give up smoking). Secondary prevention includes procedures that detect and treat pre-pathological changes, thus controlling disease progression (an example would be mammography to detect early stage breast cancer). Tertiary prevention focuses on minimizing or reducing the impact of a disease once it has developed. Yet prevention remains at the centre of heated debate. Issues for discussion have included what constitutes each of the three levels (some epidemiologists, for example, present screening and early detection as a primary prevention); whether secondary prevention can be really regarded as prevention; and whether the control of risk factors should replace the conventional focus on controlling disease.[18] Much of the conflict is located on the boundary between primary and secondary forms of prevention: it sets out arguments for prevention through public health and health promotion against those by medicine (screening). This 'confusion of preventions' derives in part from technical debates within cancer control but, as Cantor notes, it also reflects the harsh politics of the second half of the twentieth century: 'the struggle for resources, ideological divisions over public policy, and efforts of powerful vested interests to shape cancer policy to their own interests'.[19]

This book begins by exploring medical views about women's susceptibility to reproductive cancers. Chapter 2 highlights the emergence of 'sex' as a method for analysing vital statistics and the role it played from the mid-nineteenth century onwards in reinforcing gendered perceptions of cancer risk. I examine medical explanations of gender differentials in cancer mortality, setting them in the context of changing ideas about the origins of cancer. In the late 1800s the consensus that cancer was a 'female' disease was shaken by mortality statistics showing that cancer in men was rising at a much faster rate than in women. Both environmental and demographic factors were widely invoked to account for the narrowing gap between male and female cancer mortality. An alternative explanation hinged on the belief that men were more likely to suffer from cancers classified as inaccessible. As methods of diagnosis of internal cancers improved, it was argued, these cancers were more easily identified as causes of death. The debate continued well into the 1900s, but it generated no great interest in cancer in men: medical and public health attention remained firmly fastened on women's reproductive cancers.

In Chap. 3 we turn our attention to uterine cancer. Widely regarded as a hopeless, incurable disease for most of the nineteenth century, in the early 1900s the disease was refashioned into a relatively 'hopeful' cancer, 'curable' by a combination of early detection and radical surgery. I analyse this transformation in the context of debates about the curability of cancer and the establishment of therapeutic approaches based on surgery. I argue that surgery aimed at eradicating the disease did not in fact work as expected, despite continuous efforts to improve on methods. Rather than accept defeat, advocates for radical surgery sought to rationalize therapeutic failure by introducing the notion of 'surgical cure' and by reinterpreting poor results as a problem of 'delay' in treatment. The final section of the chapter examines the professional controversy over Wertheim's hysterectomy and the part it played as a catalyst for the first cancer awareness campaign of the twentieth century.

Chapter 4 examines the development of anti-cancer campaigns in England. In the early 1900s a movement for the early recognition of uterine cancer gathered momentum in a number of European countries, supported by gynaecological surgeons and obstetric physicians. Rejecting pleas for a national 'crusade' against cervical cancer, leading British obstetricians agreed in 1907 to launch a limited initiative under the aegis of the British Medical Association (BMA), which targeted doctors and midwives rather than women themselves. This approach was to dominate British efforts to promote early detection for the next half century, reflecting disagreements about the part that lay education should play in the country's cancer control effort, and anxieties about the ability of the British healthcare system to cope with increased demand for services. Medical Officers of Health (MOHs) began to take an interest in cancer education and prevention in the early 1910s, encouraged by the Ministry of Health after 1923. The chapter explores the reasons why women's cancers remained high on the interwar public health agenda, despite evidence showing that stomach cancer was the largest cause of cancer mortality when both sexes were taken together.

Public health campaigns against cancer were boosted in the late 1920s by new hopes about the efficacy of radium in the treatment of cervical cancer. In Chap. 5 I examine how the new treatment modality was added to surgery, the mainstay of treatment in the early 1900s: as an adjunct until the late 1920s, then as an alternative and, from the late 1940s onwards, as part of a combined approach to the treatment of cervical cancer. I discuss women doctors' contribution to the nascent specialty of radiotherapy, setting it in the context of debates about the organization of radium research, and controversies over the relative merits of surgery vs. radium therapy. Debates about the results of treatment led to the introduction of various classifications of cervical cancer, aimed at establishing uniform definitions of primary cervical malignancy. I show that, despite decades of efforts in this direction, the question of superiority of one treatment over the other was still undecided in the early twenty-first century.

Chapter 6 deals with the notion of 'pre-cancer' and the development of methods for the detection of 'pre-malignant' lesions: the Schiller test, the colposcope and the Pap test. These three methods are now used in the UK to screen women for cervical cancer. The story of the introduction of these methods into Britain is neither simple nor linear. One of the factors that have influenced this history has been a general reluctance, until well into the 1960s, to accept periodical examinations and screening of apparently 'well' people as preventive tools. Lack of enthusiasm for screening can also explain why the 'wet film' technique, a cytological method of intraoperative diagnosis introduced by pathologist Leonard Dudgeon in the late 1920s, failed to develop into a screening method, despite showing great promise as a means of detecting early cervical and lung cancer.

Chapter 7 picks up the theme of prevention through a discussion of prophylactic surgery. I set the scene by exploring the role surgery has played historically as a public health tool, both in the control of communicable and non-communicable disease. The chapter focuses on the management of cancer risk in women, but it also discusses the role of male circumcision as cancer prevention to raise broader questions about medical attitudes to the body at risk, and about the management of uncertainty in clinical practice.

NOTES

1. Hope, 'Bowel Cancer'.
2. Olson, *Bathsheba's Breast*, p. 9.
3. Walshe, *The Anatomy, Physiology, Pathology and Treatment of Cancer*, p. 2.
4. Shorter, *Women's Bodies*, p. 242.
5. Azouvi, 'Woman as a Model of Pathology', pp. 22–36.
6. Moscucci, *The Science of Woman*.
7. Comeau, 'Gender Ideology and Disease Theory'.
8. Gardner, *Early Detection*; Regan, 'Engendering Cancer'; Lerner, *Breast Cancer Wars*; Aronowitz, *Unnatural History*; Patterson, *Dread Disease*.
9. Berridge, *Marketing Health*, p. 47.
10. Good *et al*., 'American Oncology'. See also Eliott, 'What Have We Done with Hope?'
11. Brown and Michael, 'A Sociology of Expectations'.
12. In 2008 the Pap smear was replaced by liquid-based monolayer cytology (LBC).
13. Rocca and Ulrich, 'Oophorectomy for Whom, and for What Age?'
14. Erekson, Martin and Ratner, 'Oophorectomy: the Debate between Ovarian Conservation and Elective Oophorectomy'.
15. Löwy, *Preventive Strikes*.
16. For a public health perspective, see e.g. Bailar and Gornik, 'Cancer Undefeated'.
17. Proctor, *Cancer Wars*, pp. 265–7, *passim*.
18. For a recent discussion see Starfield, Hyde, Gérvas and Heath, 'The Concept of Prevention'.
19. Cantor, 'Introduction', p. 30.

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CHAPTER 2

Cancer: A ‘Female’ Disease

In 1846 Walter Hayle Walshe, the Irish-born physician and pioneer in the study of cancer, published a book entitled *The Nature and Treatment of Cancer*. In chapter 5, on the general pathology of cancer, Walshe discussed the role of ‘sex’ as a factor in the aetiology of the disease: ‘There is no fact in the history of cancer more absolutely demonstrated than the influence exercised by sex on its development’, he claimed. ‘The female population of this country is destroyed to about two and three quarter times as great an extent by cancer as the male, – a difference the more remarkable from the fact, that the mean rate of mortality from all diseases is 20.8 per thousand among males, while it is 19.7 among females.’[1]

The perception that cancer was a ‘female’ disease was based on the observation that women were especially liable to the malignancies of the breast and uterus. This was not, of course, a new idea: as Walshe himself noted, references to the frequency of both uterine and breast cancer could be found in many classical medical sources, from the writings of Hippocrates and his disciples, to those of Galen and Celsus. In the early nineteenth century, however, the emergence of ‘sex’ as a category of scientific enquiry gave a different meaning to women’s perceived liability to cancer. The rise of gynaecology, the ‘science of woman’, legitimated the belief that women’s bodies defined their social position and their function, which was to reproduce.[2] The liability to uterine, ovarian and breast cancer

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thus reinforced the view that the reproductive function had ‘a larger place, for good or evil, in the life of woman than in that of man’.[3]

The first statistical data on cancer mortality appeared to confirm the belief that women were more susceptible to cancer than men. In 1842 the Italian surgeon Domenico Antonio Rigoni-Stern undertook the first statistical study of cancer incidence and mortality, based on the death records of the city and suburbs of Verona for the eighty-year period between 1760 and 1839 inclusive. From his studies Rigoni-Stern concluded, amongst other things, that more women than men died from cancer; that the incidence of cancer increased with age; and that the increase was mainly due to a rapid increase in uterine cancers. In England the Registrar-General’s Office began to collect ‘vital statistics’ from 1837 onwards. By the early 1840s, the data showed that nearly three times as many women as men died each year from cancer. Then there was the investigation carried out in the Paris area by Stanislas Tanchou, a practitioner with a special interest in cancer and women’s diseases. Tanchou’s study of cancer mortality for the period 1830–40, published in 1844, revealed that the disease had claimed 9118 lives. Of these deaths, 2161 were amongst men, and 6967 amongst women.[4] Whatever we might think about the diagnosis of cancer in the past, it is Tanchou’s explanation for the sex differential in mortality that is particularly interesting: ‘Could there be a more convincing proof that cancer seeks out the weakest and more impressionable beings, those whose muscular system is least exercised’, he said. ‘Isn’t it cruel to see it attack those in whom kindness and goodness are most plentiful … How strange that the human race should be destined to be altered and impaired by very same causes that develop and perfect it.’[5] In other words, women’s reproductive potential was a double-edged sword: it was both the source of life, and the reason why women were more likely to die from cancer than men.

And not only did women outnumber men in terms of overall cancer deaths. Cancer appeared to affect women’s reproductive organs far more frequently than men’s. Tanchou reported 2996 cases of uterine cancer; 64 of ovarian cancer, and 14 of vaginal cancer. The figures for men were 21 cases of testicular cancer, 10 of penile cancer, 5 of prostate and 7 of scrotal cancer. Commenting on Tanchou’s statistics, Walshe asserted: ‘That sex exercises a powerful influence on the point under consideration is obvious.’[6] Yet neither he, nor Tanchou himself, appeared to take any notice of one important statistic: the figures collected in the Paris area showed that, by organ, stomach cancer was the second largest cause of cancer death after uterine cancer, with 2303 reported cases. Furthermore, the gender ratio was not stated for the remaining 4880 cases (i.e., 53.5 per cent of the total).

The emphasis on biological sex in the production of cancer does not mean to say that practitioners' views about cancer in women were unidimensional, however. As this chapter illustrates, physicians and surgeons thought that 'sex' was only one of several factors involved in the aetiology of cancer – some internal to the individual, others external. Age, parity, a family history of cancer, mode of life, trauma and mental trouble, to name but a few, were all implicated in the production of women's cancers. This should come as no surprise, as it was quite obvious to medical practitioners that not all women were equally liable to the disease. Biological sex may have been the predisposing factor common to all women, but it did not fully explain why some women succumbed to cancer, whereas others did not.

Explaining People's Liability to Cancer

Nineteenth-century beliefs about 'sex' as a predisposing factor for cancer must be understood in the light of contemporary notions about the constitutional nature of the disease. The concept of constitution originates from the collection of ancient Greek medical writings known as the 'Corpus Hippocraticum'. It was born of the humoral theory of disease, which posited that an excess or deficiency of any of four distinct body fluids directly influenced the individual's temperament and health: thus excess of blood gave a sanguine temperament, yellow bile a choleric one, black bile a melancholic one, and phlegma a phlegmatic one. Each temperament was associated with particular diseases: for example, phlegmatic individuals were susceptible to rheumatism, while people with a choleric temperament were prone to fevers. In the early nineteenth century the ancient word 'diathesis' (a term derived from a Greek word meaning 'disposition' or 'condition') was increasingly used to describe this predisposing of the individual to specific maladies.[7] Unlike later concepts of constitutional predisposition, the notion of diathesis linked in with a system of nosology: there were thus diatheses of the lymphatic, arthritic, syphilitic, alcoholic and tuberculous type. This mixed bag of disorders shared three main features: latency, heritability and resistance to treatment, with prognoses ranging from poor to hopeless.[8]

The predisposition to cancer could be inherited, or acquired through prolonged exposure to a number of biological, social and environmental factors. Given enough time, though, an acquired predisposition became fixed as a hereditary tendency which was difficult to eradicate. Under the heading of 'acquired causes', Walshe listed not only biological sex, but also age, temperament, marital status, general state of health, 'depraved' habits such as drunkenness and debauchery, mental state, occupation, climate and the prevailing mode of social organization (like many later writers, Walshe believed that people living in highly civilized societies were more prone to cancer than 'primitives').

People who had a predisposition to cancer were more susceptible to the action of 'exciting' causes: trauma and mechanical or chemical irritation. But neither trauma nor irritation was deemed to be sufficient to cause the disease. Physicians insisted that individual predisposition was a necessary condition for the production of cancer. James Copland, for example, stated that 'although irritating agents of any description may give occasion to its appearance, yet there must have previously existed cancerous diathesis, or constitutional disposition, in which it almost always originates'.[9] Whether this predisposition was due to some condition of the blood or to some other undefined derangement of structure was the subject of great debate. The so-called 'blood theory' of cancer had a strong supporter in James Paget, the leading mid-Victorian surgeon and pathologist. In his *Lectures on Surgical Pathology*, published in 1853, Paget claimed that 'the existence of the morbid material in the blood, whether in the rudimental or in the effective state, constitutes the general predisposition to cancer; it is that which is, by some, called the predisposing cause of cancer. The morbid material is the essential constituent of the 'cancerous diathesis, or constitution.'[10]

The constitutional theory of cancer competed with another vision of cancer's aetiology, proposed in France by François Broussais, the founder of the so-called 'physiological' school.[11] Broussais taught that every ailment was the result of a specific organic dysfunction—the consequence of either too much excitation (*irritation*) or too little (*asthénie*). The task of physiological medicine was to determine how excitation could deviate from the normal state and constitute an abnormal or diseased state. Broussais rejected the notion of diathesis. He claimed that external irritation alone, if protracted for a sufficiently long time, could cause tissues to degenerate, culminating in their transformation into malignant tumours or tubercle.

The importance of 'chronic irritation' as a factor in the aetiology of cancer increased considerably in the second half of the nineteenth century as the so-called 'local theory' of cancer, commonly associated with the work of Rudolf Virchow, began to gain acceptance in Britain.[12] Virchow proposed that irritation and trauma were the main cause of tumour formation, supported by some local predisposition of the tissues. This understanding of cancer served to direct attention to a variety of environmental factors which might have an irritant action – from dirt to alcohol.

Acceptance of the 'local theory' of cancer did not cause physicians to abandon the belief that constitutional predisposition played a key role in the production of cancer. By the end of the nineteenth century, however, individual susceptibility to cancer (and to other chronic diseases such as phthisis) had been reformulated in the language of 'seed and soil'.[13] Any condition that lowered the general condition of the organism, such as poor nutrition or advancing age, was thought to 'prepare' the soil on which cancer may grow. Charles Childe, the early twentieth-century English anti-cancer activist, proposed that the soil of cancer derived its favourable ingredients from hereditary predisposition; from the action of some external surroundings, or from some defect in the general economy. However prepared, it always received a 'top-dressing' of advancing age. If the individual was then exposed to 'that other great factor' connected with the onset of cancer, namely chronic irritation, all the material conditions for the production of the disease were in place. In cases where the soil was rich and well prepared, even a small amount of local irritation may be sufficient to start it. On the other hand, if the soil was poor, 'a large dressing of age, or a large dose of local irritation may be necessary to remedy this deficiency; and there may be countless degrees between these two extremes'.[14] In many cases, though, cancer seemed to attack the individual out of the blue, for no apparent reason. It was this unpredictability and idiosyncrasy, as much as the possibility of a painful and degrading death, which gave cancer its terrible reputation as a 'dread disease'.

Women's Proclivity to Cancer

In the early 1800s it seemed quite obvious to physicians and other writers on women's diseases that organs like the uterus and ovaries, periodically subjected to congestion and frequently affected by sudden changes in nutrition and vitality, should be prone to develop cancer. Sexual intercourse and its concomitant factors, such as childbirth, were a particular focus of interest. Cancer statistics suggested that uterine cancer was more frequent in married women who had a large number of children. In

1839, for example, J. C. W. Lever's analysis of 120 cases of uterine cancer seen in the out-patient department of Guy's Hospital, London, revealed that 103 women were married, and that each had borne an average of 5.75 children.[15] Other writers asserted that excessive sexual intercourse was capable of exciting uterine cancer, despite the fact that prostitutes appeared to suffer from the disease less frequently than married women.[16] The French midwife Marie Boivin and her physician son-in-law, Antoine Dugès, proposed that frequent excitation of the cervix in the married (probably caused by 'disproportion' of the organs of generation) could lead to cancer; they also claimed that masturbation often seemed to be the only likely cause of uterine cancer in women known to have indulged in the 'depraved habit'.[17]

Data showing that the mortality rates for women rose steeply and abruptly between the ages of thirty and fifty, whereas the death rate for men increased steadily with advancing age, served to direct the attention to the decline and cessation of the reproductive function as a predisposing factor in women: 'Cancer appears much more frequently in females than in men; it is said, in the proportion of ten to one', surgeon Caesar Hawkins asserted in 1838; 'and in females (in whom it takes place chiefly in the uterus and mamma), the disease occurs very often about the time that menstruation begins to cease, when these organs are no longer useful'.[18] Edward Tilt, the author of a popular volume on the *Change of Life in Health and Disease*, characterized the menopause as a time of crisis, frequently marked by prolonged ill health. Once a woman had crossed this physiological Rubicon, she could expect a great improvement in her general health, and often in physical looks; 'but if cancerous seeds of destruction have been slumbering for years in the system', he warned, 'the c.[change] of life will, in general, prove fatal'.[19] The link between cancer and the menopause was taken for granted by the last quarter of the nineteenth century, as cancer in general came to be seen as a degenerative condition, associated with the processes of ageing in the organism. According to James Paget, for example, cancer was more frequent in women than in men because the uterus and breasts in women of forty or fifty were 'already in a condition which one may closely compare with senile degeneracy'; indeed these organs at fifty had to be compared 'not with any organs of men at fifty, but with organs of men at seventy, eighty, or ninety'.[20] By the late nineteenth century, cancer surgeon Herbert Snow could say that

> cancerous diseases are almost wholly restricted to old or elderly individuals on the one hand, on the other to organs or tissues similarly past their prime, decrepit and enfeebled. Organs which have fulfilled their purpose in the animal economy … are the most common prey of cancer; such are the female breasts after the age of thirty-eight and the uterus from the same period or from one slightly earlier.[21]

‘Male’ parts were less susceptible to cancer because they continued to fulfil a sexual and reproductive function. According to Henry Butlin, the late nineteenth-century surgeon, men’s sexual organs had a particular resistance to cancer: while the female external genitals were ‘more or less prone to cancer’, ‘the scrotum is not at all prone to cancer unless it is prepared for its occurrence in some special manner’.[22]

Women were deemed to be more at risk from uterine and breast cancer if they had a family history of cancer. Data on the familial incidence of malignant disease were few and far between in the nineteenth century, and many authors acknowledged that published figures were unreliable. Nevertheless, the belief that a family history of cancer predisposed the individual to the disease was widely held throughout the century: indeed, arguments about the constitutional nature of cancer rested largely on its supposed heritability. Practitioners insisted that a history of cancer in the family, particularly of breast cancer, increased women’s risk: ‘Out of all proportion to their liability to Cancer above men, it is among women that multiple family Cancers prevail’, wrote surgeon Charles Hewitt Moore in 1865.[23] He claimed that the usual sex ratio was five women to two men; women who had a family history of cancer were eight times as likely to be diagnosed with cancer as men. The higher level of risk was reflected in the higher insurance premiums charged by life insurance companies to female applicants with a family history of cancer. Thus in his 1884 monograph *The Medical Adviser in Life Assurance*, Royal Physician Edward Henry Sieveking stated that:

> Practically we cannot ignore the undoubted hereditariness of cancer, and as the female organs of reproduction are specially liable to the disease, and we have seen that the female sex has an infinitely greater proclivity to cancer generally than the male sex, we must specially consider the influence of this hereditary taint where we have to deal with a female applicant for insurance.[24]

According to Joseph Payne, the late nineteenth-century physician and life assurance medical officer, no female applicant with a well-established family history of cancer should be accepted at the ordinary rate; two female deaths from cancer of the breast (including the mother) made the life ineligible.[25]

Physicians and patients alike subscribed to the belief that mechanical violence could bring about cancer in predisposed individuals: cancer of the uterus, breast, testes and brain were regularly linked to injury suffered by the patient, often many years before the malignancy manifested itself. A particular issue for women was violence at the hands of a husband or partner: case reports published in the Victorian period sometimes mentioned a history of domestic violence in women diagnosed with either cervical or breast cancer. William Roger Williams, the late nineteenth-century cancer expert, thought that patients' narratives overstated the importance of 'blows' as a cancer cause, but he nonetheless agreed that trauma played a part in a 'long train of antecedent preparation'. He regarded the relation of trauma to cancer 'as resembling that of a spark in contact with combustible material, the result depending on the nature of the latter, rather than upon the spark itself'.[26] The quality of the soil, in other words, mattered more than the seed.

In the second half of the nineteenth century 'chronic irritation' was increasingly invoked as a factor in the production of cancer in both sexes. Medical writers blamed the frequency of lip cancer in men on the use of clay pipes. They warned women that the long-term wearing of stays and corsets could lead to breast cancer, and they increasingly blamed cervical cancer on the recurrent abrasions, lacerations and infections associated with multiparity and poor obstetric care. By the late nineteenth century, the supposed link between cancer of the cervix and childbirth trauma provided a means of accounting for higher rates of death from cervical cancer in women of lower social class. Poor women had large families, and they could not afford skilled medical care in childbirth. They were thus more liable to suffer from cervical tears which, if left untreated, could become the seat of inflammation and infection, leading to cancer.

Late nineteenth-century practitioners' obsession with chronic irritation served to throw the spotlight on the role of uncleanness in the aetiology of cancer. Penile cancer had long been associated with chronic irritation arising from the accumulation of secretions under the prepuce. By the late 1800s there was an extensive literature highlighting the danger of cancer in uncircumcised men. Obstetrician William Japp Sinclair claimed that 'chronically filthy genitals' in women were associated with an increased risk of cervical cancer.[27] He considered this to be a problem affecting chiefly women from lower socio-economic strata. Charles Childe advised that cancer prevention started with hygiene. He thus urged people to pay special attention to what he called the 'toilette' of those parts of the body where cancer was most likely to occur.[28] The time-honoured precept 'cleanliness is next to godliness' still held true for Childe, but the term 'toilette' also evoked the cosmetic dimensions of hygiene: the association of cleanliness with grooming and the beautification of the body.[29]

In the early 1900s Jewish physicians and surgeons focused on the preventive role of the Mosaic laws regarding marital relations and ritual bathing of women. Aimed at combating racist claims of innate differences between Jews and non-Jews with regard to the incidence of particular diseases, these studies chimed with contemporary concerns about the importance of hygiene in the prevention of cancer. Adolf Teilhaber and his son Felix, the Munich physician and Zionist, offered statistics showing that Jewish women in Munich had a much lower risk of developing cervical cancer.[30] The Teilhabers explained the figures by invoking the sexual practices of the Jews. They claimed that the laws imposing sexual abstinence on Jewish women during and after their menstrual cycle decreased the amount of 'continued irritation' and subsequent inflammation that predisposed to cervical cancer. In 1931, a time when Aryan race theories abounded and the 'Jewish question' was taking on enormous political significance, a young surgeon at the London Jewish Hospital called Maurice Sorsby looked at the cancer statistics of ten European cities.[31] The cancer mortality data were particularly inconsistent as far as the Jews were concerned: the overall mortality was lower in some cities, and higher in others. Sorsby found, however, that Jewish women did enjoy a remarkably lower rate of uterine cancer than non-Jews. As he could find no evidence that Jewish women were less subject to childbirth trauma than their non-Jewish sisters, he proposed that the regulated sexual life of Jewish women had a protective effect. The Mosaic code, with its insistence on local cleanliness and abstention from sexual intercourse during the presence of a blood-stained discharge, served to reduce the risk from irritation. Other contemporary (non-Jewish) commentators claimed that circumcision protected women from cervical cancer, citing as evidence the low incidence of the disease amongst the Jews and circumcised Fijians.[32] The argument here was that the bacteria under the foreskin caused chronic irritation in the female partner, leading to cervical cancer.

The view that cancer is linked with personal and emotional traits has a long history dating back to Ancient Greece, when Galen asserted that cancer resulted from an excess of black bile, linking it with the melancholic disposition. In the Victorian period sorrow and 'mental trouble' were frequently mentioned as a factor in the production of cancer, particularly in women. This is perhaps not surprising, since women were consistently ranged on the side of excess emotion, in contrast to the more stable-minded male of the species. The most vocal proponent of this theory was Herbert Snow, surgeon to the London Cancer Hospital. Snow believed that the cancers specific to women, those of the breast and uterus, tended to be caused by 'trouble of mind: and by other analogous conditions, of a neurotic character'.[33] He insisted that physicians never saw malignant disease 'developed in the mamma of a woman leading a healthy, happy, well-balanced life'.[34] According to Snow, all malignant lesions were 'consecutive to a special exciting cause, which may be direct or indirect'.[35] Trauma and irritation caused cancer directly; 'neurotic antecedents' such as anxiety, depression and overwork precipitated the disease indirectly, by interfering with the 'nerve forces' which normally controlled the nutrition and function of cells. Snow's insistence on disrupted nerve force as a factor in the aetiology of women's cancers must be understood not only in terms of contemporary beliefs about woman's nature, but also in the context of debates about the heritability of cancer. As mentioned earlier, the tendency for uterine and breast cancer to run in families was frequently cited as evidence that the cancerous disposition was inherited. Snow rejected this belief. Indeed, he proposed that unfounded anxieties about its supposed heritability could in themselves initiate the disease: 'It is obvious that the sword of Damocles, which the belief in heredity holds suspended over the heads of any unfortunate enough to have lost a relative from cancer, must act powerfully as a mental depressor', he wrote in his 1891 treatise on *The Proclivity of Women to Cancerous Diseases*. He claimed that the tendency for women's cancers to affect successive generations could be explained in this way.[36]

In the late nineteenth century, uterine cancer began to acquire a distinctive class identity as a '*morbus miseriae*', a disease of poverty. Cancer statistics showed that high parity was associated with a high risk of developing cervical cancer. As poorer women tended to have large families, physicians inferred that uterine cancer must be linked with lower social class. The most frequent explanation for the supposed class differential in mortality was the incidence of childbirth trauma and its consequences. But a few obstetricians in England and continental Europe also highlighted the effects of socio-economic deprivation on women’s health. Thus an early twentieth-century German reviewer, commenting on an article in which it was stated that cervical tears were the chief cause of cancer, and hence the frequency of cases in Germany as compared with America, suggested that the comparative immunity of American women depended on better social conditions.[37] In England Herbert Snow claimed that ‘a life of hard work, of occasional privation, of too-frequent childbearing and prolonged lactation, greatly predisposes [to cervical cancer]’.[38] He was echoed by William Japp Sinclair, the Manchester obstetrician, who painted a grim picture of the material privations and risky exposures resulting from low income and economic hardship: ‘The domestic circumstances and the class of the sufferers imply a vast amount of unhappy experience of life’, he observed in 1896.[39] On the physical side there was the constant drain on the constitution of frequent pregnancy and lactation, often aggravated by childbirth injury and local inflammation – not to mention the chronic deficiency of nourishing food, suitable clothing and adequate sanitation. Many working-class women also led laborious lives in the discharge of their domestic duties, or as breadwinners of sick, lazy or debauched husbands. In this regard Sinclair emphasized the danger of gonorrhoeal infection, brought home by promiscuous husbands. Gonorrhoea had long been regarded as a disease that largely affected men but, as Worboys describes, its gendered status began to change in the late 1800s. By the early 1900s, obstetricians believed that gonorrhoea was much more serious in women than in men, blaming it as a cause of pelvic inflammatory disease, infertility and cancer.[40]

On the mental side, Sinclair argued, there was constant anxiety about money, worries about the threat of unemployment, anxieties from the illnesses of husbands and children, and grief from the frequent fatal termination of illness in both young and old: ‘Add to all this the constant monotony of the lives of such women’, Sinclair concluded; ‘the lives of the men are by comparison interesting and free from care’.[41] Sinclair was thus confident that deaths from cervical cancer would decline as social conditions improved: ‘The hypothesis of *morbus miseriae* places cancer of the cervix in the same category as leprosy’, he wrote in 1896;

> and by analogy we may assume that cancer may be banished by social amelioration which will raise the existing cancer-producing class to the higher level of the presently existing immune, just as the disappearance of the horrors in

> the individual lives and environment of past generations has made leprosy in England a historic disease.[42]

Not everyone agreed with the view that uterine cancer was a disease of poverty. In a volume published in 1901, cancer expert William Roger Williams argued that the disease was more frequent among the upper than the lower classes.[43] Yet the association of uterine cancer with lower socio-economic status remained well entrenched in the literature: indeed, when the mortality from cervical cancer began to decline in the mid-1930s, many commentators assumed that improved social conditions and better hygiene must be part of the explanation.[44] The perception that uterine cancer was a disease of the poor may have had the unfortunate consequences of misdiagnosis and late treatment for the upper- and middle-class women who developed the disease. Higher class women may have regarded themselves at low risk from uterine malignancies and disregarded the signs and symptoms that might have meant cancer. They may also have been more likely to be incorrectly diagnosed with benign conditions of the uterus when they presented with suspicious symptoms.

A Geography of Women's Cancers: Alfred Haviland's Geological Theory

One of the ways in which cancer began to gain visibility as a social, medical and administrative problem was through the compilation of maps showing geographical patterns in cancer mortality. In 1868 Alfred Haviland, a Medical Officer of Health, gave a lecture to the Medical Society of London, in which he used maps to investigate the distribution of heart disease. Struck by the excess of cancer mortality in women, as revealed by the Registrar-General's statistics, Haviland turned his attention to mapping the geographical distribution of women's cancers. In the late 1860s he gave two lectures on the subject, published in 1869 as a pamphlet. A few years later he collected his notes and additional research to produce an influential book: *The Geographical Distribution of Heart Disease and Dropsy, Cancer in Females, and Phthisis in Females in England and Wales.*[45]

Born in Bridgwater, a market town in south-west England, Haviland was the son of a physician. He did his medical training at University College Hospital in London and in 1845 he joined his father's practice. He became honorary surgeon to the Bridgwater Infirmary, but in 1867 his surgical career was unexpectedly cut short by a near-fatal incident: he contracted septicaemia during an operation, and one of his fingers had to be amputated. He subsequently took up a post as Medical Officer of Health for the Northampton district, where he established a reputation as a tireless worker for public health.[46]

It was during the period of forced inactivity after his accident that Haviland began to take an interest in the use of maps to chart the distribution of disease. Cartographic work of this kind had been stimulated in England by the great outbreaks of cholera in the first half of the nineteenth century: cholera maps provided a means of relating patterns of disease incidence to local characteristics, highlighting hazards that might promote the disease (according to this or that theory).[47] Haviland himself traced the genesis of his interest in the subject to the cholera epidemic of 1849, although on that occasion he was more preoccupied with the relationship between different weather patterns and changes in virulence during the epidemic. A self-avowed disciple of Hippocrates, he had a keen interest in 'iatrometeorology', a term he coined to denote the medicine of climates and places. Haviland also acknowledged the influence of William Farr, the first superintendent of the Statistical Office. In his first letter to the Registrar-General of Great Britain, written in 1839, the eminent medical statistician had suggested that the mortality data for different diseases might be usefully displayed on maps. He thought that a sanitary map of the country would be invaluable to physicians and patients alike in highlighting the locations that promoted health and well-being, and those that posed a danger to health.[48]

After the publication of *The Geographical Distribution of Heart Disease, etc.*, Haviland made medical mapping his special field of work. He became lecturer on the geographical distribution of disease at St Thomas' Medical School, and in 1879 he was awarded the Royal Society of Arts' silver medal for a paper on the 'Distribution of Disease Popularly Considered'. A prolific writer, Haviland published many other works on climatology and meteorology, including a number of pamphlets and articles on the health properties of resorts like Brighton and Scarborough.

Haviland's work on the distribution of disease had both practical and theoretical objectives. On the one hand, he hoped to make a contribution to disease prevention; on the other hand, he sought to produce a grand theory of disease causation related to geography. To this end he plotted the information on the maps of England and Wales at three different levels: division, county and district. He then analysed the resulting patterns of mortality in terms of physical geographical phenomena such as geology, relationship to coast, prevailing winds and so on. The study led him to conclude that heart disease in women was prevalent in areas where the geomorphological configuration of the landscape impeded the free flow of sea winds. Phthisis, on the other hand, was associated with exposure to winds, particularly from the east, as well as with high elevations and damp clayey soils. The pattern Haviland identified for cancer implicated other geological factors. Areas where rivers were prone to flooding, particularly those with poor drainage, had the highest rates of female cancer mortality. Haviland drew one conclusion from this observation: 'the maps teach us that the high, dry sites on the older rocks are the places where Cancer does not thrive, and that it does thrive in the vales by the sides of large rivers, which overflow their banks, and in the neighbourhood of which are to be found the drifts of ages of washings from the inhabited country above'.[49] By framing cancer as a sanitary problem, Haviland was able to assert the pre-eminence of environment over heredity. This in its turn served to establish the preventability of cancer. Given the right environmental conditions, he claimed, even an inherited tendency to cancer could be corrected: 'When there is a tendency to Cancer let the patient be removed to the high, dry sites', he urged;

> and perchance if whole families were thus to emigrate, we should not hear so much of the hereditary character of this or of many other diseases. We never hear of ague being hereditary. Father, son, and grandson have ague one generation after another whilst living in an ill-drained fen district, but send them to the hills and their plague disappears; so may it be with the mother, daughter, and granddaughter, afflicted in their turn with Cancer of the breast or the womb, while living generation after generation under the same climactic conditions, on the same geological site, and on the banks of the same river.[50]

Haviland was later to link rising cancer mortality rates to the development of modern drainage systems. He claimed that improved drainage had increased the likelihood of floods, leading to higher sewage levels in rivers. Higher sewage levels meant increasing rates of mortality from cancer.[51]

Haviland's work received a mixed response from his contemporaries. The German physician Augustus Hirsch, one of the most respected nineteenth-century writers on medical geography, argued that Haviland's material was not trustworthy; furthermore, his generalizations were refuted by evidence from the mountains of Norway and the plateaux of Mexico, both of which had high rates of cancer mortality.[52] An anonymous reviewer in the *Athenaeum* for March 1876 praised the quality of the maps, but he also identified major weaknesses in both methods and results.[53] Cancer surgeon Herbert Snow, writing in 1890, queried the reliability of the data. He also criticized Haviland's failure to consider factors other than geology: for example, the lifestyle and occupation of people living in the cancer areas, and the existence of large hospitals or infirmaries that may have treated cases from outside the locality.[54]

A few practitioners felt that Haviland's findings merited further investigation, though, and they used his mapping method in local studies of cancer mortality. Thomas Law Webb, a modest general practitioner living in Ironbridge on the River Severn, became famous for his cancer maps of the parish of Madeley. The maps revealed the existence of 'cancer houses', that is to say houses which had, over the years, several deaths from cancer amongst the tenants. Law Webb suggested that these localized cancer clusters were somehow associated with the proximity of drains and the use of water from a particular pump.[55] His data were subsequently analysed by Karl Pearson, the famous statistician, philosopher of science and eugenicist. Pearson concluded that the maps did not provide definitive proof that cancer was more frequent in particular houses, but he also added that the data justified a fuller enquiry into the connection between cancer and various environmental hazards.[56]

Haviland's work was also influential in stimulating the first surgical enquiry into breast cancer, carried out in 1885 by the British Medical Association's Collective Investigation Committee.[57] Chaired by Henry Butlin, the enquiry aimed to throw further light on the role of locality, heredity and diet in the aetiology of the disease.[58] The Committee received 210 returns and a large number of letters, mostly from general practitioners. The general trend of the returns appeared to bear out Haviland's hypothesis, but in his discussion Butlin highlighted some evidence that contradicted it: for example, differences in mortality between the two banks of certain rivers, and high mortality rates in towns that were not sited in supposedly cancerous areas. In addition, Butlin remarked on a major flaw in the methodology: Haviland had made no attempt to map the distribution of cancer in males. There was thus no way of telling whether the association of the disease with poor drainage also applied to male patterns of mortality, and if not, why not.

Haviland went some way towards rectifying this omission in *The Geographical Distribution of Disease in Great Britain*.[59] Published in 1892, the volume was intended as the second edition of the first study, although the title and the geographical focus differed from the earlier work: the 1892 volume covered the English Lake District, and in addition to studying heart disease, phthisis and cancer in females, it examined the geographical distribution of diseases of the stomach and liver, kidneys and uterus in both sexes. After analysing male cancer patterns, Haviland concluded that high mortality regions were similar for both males and females. He reiterated that the highest rates of mortality were found in the flooded clay districts, while low mortality correlated with areas underlaid by limestone. What was new in his explanation was the idea that cancer might be caused by bacteria.[60] By 1890, there was a growing consensus in medicine that the origin of many diseases lay in the pathogenic actions of bacteria. Haviland saw no problem with this view, largely because he constructed bacteria as infectious miasms. He pointed out that the bacilli of diseases like typhoid and cholera had been shown to grow well on moist, dead portions of plants. To his mind, the geographical distribution of cancer supported the belief that ill-drained areas covered by layers of decomposing vegetable matter provided an ideal breeding ground for 'countless vagabond organisms', some of which may cause cancer.[61]

Hunting for the Cancer Microbe

In the early 1890s the hypothesis that cancer may have a parasitic or microbial origin began to attract increasing public and medical attention: at the International Congress of Hygiene and Demography, held in London in 1891, a quarter of the time of the section of bacteriology was devoted to cancer. Discussions about the microbial origins of cancer drew upon contemporary debates about other diseases for which a germ aetiology had been claimed, particularly tuberculosis, malaria and typhoid fever. Microbial theories of cancer opened up new possibilities for treatment and prevention, but they also served to dramatize the cancer threat by raising public fears of contagion and infection. Fuelled by sensational press reports, health scares over the safety of tomatoes, old books, the clothes and bedding of cancer sufferers, and so on, periodically gripped the country. Although the existence of the cancer microbe had yet to be proved, public health officials and cancer experts cautiously recommended the cremation of cancerous bodies, the periodical disinfection of houses where cancer victims lived, and the incineration of dressings and excreta, just in case.

The parasitic hypothesis served to rationalize cancer's predilection for body sites like the stomach and uterus: both organs were easily accessible to infective agents entering the body from without, and they also provided the conditions that laboratory experimentation had shown to be ideal for their growth. According to the general practitioner Alexander Brand, for example, it was not difficult to imagine how 'the loose and open arrangement of the nether garments of the majority of women' might facilitate access of the infective micro-organism to the generative organs.[62] Moisture, adequate nutrients, constant temperature and the exclusion of light and air provided an excellent environment for germs to breed.

The construction of the cancer 'germ' relied not only on a new set of laboratory routines (extraction, filtration, cultivation and inoculation), but also on evidence about the geographical distribution of the disease. In 1889 the French physician M. Arnaudet caused a minor sensation when he revealed that the mortality from cancer at Saint-Sylvestre-de-Cormeilles, a small village in Normandy, was three times higher than in Paris. Arnaudet claimed that his enquiries into family history and lifestyle had produced no evidence about the influence of heredity or alcoholism. He blamed instead the impure pond water used in the production of cider, arguing that it served as the vehicle for the transmission of a supposed cancer microbe.[63]

After the publication of Arnaudet's report, accounts of 'cancer villages' and 'cancer houses' in countries as far apart as Italy and the United States began to appear with increasing frequency in both the medical and the lay press.[64] The big question was how the micro-organism might be transmitted. Some thought that the parasite came from the putrid discharges of patients and spread through soil and water.[65] The discovery of malaria-bearing mosquitoes, on the other hand, raised the possibility that the micro-organism might be insect-borne. In a study of the local distribution of cancer and cancer houses, published in 1899, the eminent surgeon and medical historian D'Arcy Power asserted that the infective agent was a *contagium vivum* carried by an intermediate host.[66] In the 1910s Johannes Fibiger, the Danish physician and pathologist, famously claimed that a parasite he called *Spiroptera Carcinoma* caused cancer of the stomach in rats, and that cockroaches might be the vectors. The theory, which won Fibiger the 1926 Nobel Prize for 'Physiology or Medicine', was strongly supported in England by the flamboyant parasitologist Louis Sambon, a lecturer at the London School of Hygiene and Tropical Medicine and a close friend of Patrick Manson. Sambon's investigation of 'cancer houses' in the Trentino region of Italy supported claims of a causal relationship between the presence of ringworm (*Gongylonema*) and the formation of neoplasms, but a study undertaken by one of Sambon's colleagues, the renowned helminthologist Robert Leiper, put paid to the theory that there was a close relationship between ringworm and cancer.[67] By the late 1930s even Fibiger's rat tumours had been shown to be non-malignant, and the theory sank into oblivion.

The 'cancer house' hypothesis was challenged in the early 1910s by Ernest Bashford, the first Director of the Imperial Cancer Research Fund (ICRF). Bashford conducted a comprehensive analysis of five of the best-known instances of cancer houses, based on special studies and site visits. He concluded that so-called cancer houses, cancer streets and cancer villages were a myth generated by inadequate numerical facts, serious errors in reporting, and inaccurate statements regarding age, anatomical site and certified cause of death.[68] By 1920 most cancer experts were denying the existence of 'cancer houses' and 'cancer villages', but this belief continued to maintain a powerful hold on the public imagination. The British Empire Cancer Campaign (BECC), one of Britain's main cancer research organizations, opened a file on the subject in 1923, following the publication of press articles on Sambon's research. Throughout the interwar period the charity fielded queries from anxious members of the public, who expressed wide-ranging fears of contamination from graveyards, hospital laundries, dwellings previously occupied by cancer sufferers, and stagnant waters which might harbour the cancer germ.[69]

One of the questions that arose in connection with the infectious theory of cancer was the possibility of person-to-person transmission. This was not a new idea (the first observations about cancer's supposed contagiousness went back to the seventeenth century), but it acquired new plausibility in the light of germ theories of disease. According to some physicians, anyone who lived in close quarters with a cancerous person ran the risk of contagion. The most widely cited study, by the French surgeon Octave Guelliot, described 103 cases that were attributed to direct contact with a cancer sufferer.[70] Not surprisingly, Guelliot believed that 'cancer à deux' was especially common in married people, with both penile and cervical cancer showing a marked tendency to occur at the same time, or in close succession.

The flurry of excitement about the infectious hypothesis was short-lived. In the early twentieth century scientists who studied cancer in mice and rats found that cancer could not be transmitted from species to species either by inoculation or by transplantation, and that attempts to transplant tumours to individuals of the same species were not consistently successful. The focus then shifted to host resistance and 'hereditary factors' of susceptibility to tumour grafts.[71] In the meantime, parasitic theories had done much to raise the public profile of cancer not only by engendering widespread public anxiety about the spectre of contagion, but also by leading to the establishment of laboratory facilities for research, much of which was initially focused on the microbial hypothesis.

Gender Differentials in Cancer Mortality: A Narrowing Gap?

The perception that women were more liable to cancer than men was challenged at the end of the nineteenth century by statistics showing that cancer mortality among males was rising. In the mid-1880s the Annual Reports of the Registrar-General began to draw attention to the steady increase in the registered death rate from malignant disease since the middle years of the century. The most striking feature of the data was the unequal distribution of the ratio of increase of registered mortality: according to the tables compiled by the Registrar-General's Office, the male mortality showed a much greater increase than the female mortality, both in the aggregate, and at each separate age period after age thirty-five. During the 1871–80 decade, the mortality rate of males aged 35–45 had increased by 39 per cent as compared with the previous decade. The percentage increase for men rose rapidly with age, reaching 74 per cent in males aged 75 and over. In females, the rate of increase was 35 per cent for women aged between 35 and 45, reaching a peak of 52 per cent in females aged 75 and over.[72]

Government officials argued at first that the increase in male deaths was due to improved diagnosis and more careful certification, rather than to an increase in the incidence of cancer. The basis for this assertion was that men suffered from internal or inaccessible cancers in much larger proportion than women; hence any improvement in the recognition of the disease would have added more to the male than to the female figures.[73] By 1890, however, the position of the government's Statistical Office had shifted. In the Fifty-Second Annual Report, it was stated that

> in face of the constant and great growth of mortality under this heading, and the expressed belief of medical practitioners specially engaged in dealing with this class of diseases that they are really becoming more and more common, it seems scarcely possible to maintain the optimistic view that the whole of the apparent increase can be thus explained; and it must be submitted, as at any rate highly probable, that a real increase is taking place in the frequency of these malignant affections.[74]

As the report intimates, by 1890 most practitioners had reached the conclusion that the increase in cancer mortality reflected a true increase in incidence of cancer. Several commentators blamed increasing rates of death on 'civilization', highlighting the deleterious effects of modern fashion and lifestyle: thus the vogue for stays and corsets was linked with breast cancer, while increasing rates of consumption of alcohol and meat were associated with rising rates of stomach, bowel and rectal cancer, particularly in men. Herbert Snow warned that the growing severity of the struggle for survival in modern society was leading to higher cancer rates. He claimed that the stress of competition disrupted normal cell growth, making people vulnerable to the disease. In evidence he cited Haviland's maps, which showed a concentration of cancer along the great rivers 'where large towns are situated, and where competition is most keen'.[75] William Roger Williams ascribed increasing rates of male cancer mortality to urban living conditions: want of proper exercise, excess of food, and a 'domesticated mode of life' were emasculating men, making them more susceptible to 'women's diseases'.[76] Williams was convinced that male cancer rates would soon overtake women's, unless the disproportionate increase of cancer among males was checked.[77]

Other practitioners claimed that the supposed increase in cancer incidence reflected the larger number of people who survived to the 'cancer age'. As early as 1865 Charles Moore, a surgeon at the Middlesex Hospital in London, had argued that cancer could be ascribed 'to corn-laws and good living, to the discoveries of gold, to the good government which has reared to adult life and to old age a larger proportion than heretofore of the entire population'.[78] Greater wealth and amelioration of sanitary conditions improved life expectancy, but an ageing population was more susceptible to the ravages of cancer. Later in the century Malcolm Morris, the well-known dermatologist, described rising mortality rates from cancer as 'the necessary penalty of sanitary progress'. Writing in 1899, he drew attention to the significance of changing demographics: 'More people now live to an age at which they are liable to become the prey of cancer than in the brave old days when there were no drains and the fear of the microbe was unknown.’[79]

Arguments supporting the ‘improved diagnosis’ hypothesis were submitted in the early 1890s by George King, a distinguished actuary, and Arthur Newsholme, a public health official and epidemiologist who was later to become Chief Medical Officer to the Local Government Board.[80] In a paper published in the *Proceedings of the Royal Society of London* for 1893–4, Newsholme and King asserted that comparisons based on the crude rates of mortality from cancer were misleading. As the disease was much more common in older people, it was essential to adjust the crude rate in order to eliminate the effect of differences in population age structures. Using the official data for England, Wales, Ireland and Scotland, and the records of the Scottish Widows’ Life Fund Office, a commercial life-insurance company, they applied the age-specific mortality rates for these populations to a population of a million, distributed by age according to Farr’s national life tables. By using this method they were able to show that when crude rates were used, Ireland had higher death rates from cancer than England and Wales; when standardized rates were compared, the Irish rates were consistently lower. The reason for the discrepancy, they argued, was that Ireland had a much older population than England: standardized rates corrected for the effects of differing age structures.

Newsholme and King next turned their attention to long-term trends in cancer mortality for males and females. They assumed that any general increase in cancer incidence should have affected both sexes, and that the mortality differential between men and women would also have increased as the mortality curves rose. This would have caused the mortality curves to diverge over time. What one could see instead was that the distance between the curves had remained practically constant throughout the period in question: hence the figures could not reflect an increase in cancer incidence. Newsholme and King also examined the hypothesis that the mortality curves had remained parallel because cancer had increased in much greater proportion among males. Citing the death returns of Frankfurt am Main, where deaths from cancer had been classified according to site over a long period of time, they claimed that if the data were reclassified into ‘accessible’ and ‘inaccessible’ cancers, cancer of accessible parts, which occurred ‘chiefly among women’ was almost unchanged, while cancer of inaccessible parts showed a very great increase. The conclusion was thus that the increase of cancer in England must be due to better diagnosis of the 'inaccessible' malignancies.

An investigation carried out by the ICRF in 1904 lent support to the Newsholme–King thesis, but medical opinion was divided. William Roger Williams sharply criticized the claim that there had been no real increase of cancer as a 'statistical sophism, based upon fallacious figures as well as upon fallacious reasoning'.[81] He argued that, if improved diagnosis had caused additions to the cancer total, it had also caused subtractions from it: common diseases like 'fibroid', 'polypus' and 'lupus', for example, were classed as cancer right up to 1880, but they had since been reallocated to other categories. Williams also referred to the work of Dr Claud Muirhead, the medical officer of the Scottish Widows' Life Assurance Society. In 1902 Muirhead had analysed the death rate of male policyholders during 1881–90 and found that the mortality had almost doubled compared with the previous decade. Muirhead argued that the sharp rise in male mortality could not be attributed to improved diagnosis and death certification, as the members of the Society could command the services of highly skilled medical men, and every death where there was a suspicion of cancer was carefully investigated.[82] Williams's own enquiry, which was based on the official cancer mortality data by site, showed that there had been no special increase in the 'inaccessible' manifestations of the disease.

The statistics released by the Registrar-General in 1906 threw further doubts on the Newsholme–King hypothesis by showing that the male mortality rate for oral cancer as compared with women's had increased sharply since 1889. The large excess of mortality among males (7246 cases in the four years 1901–4 as compared with 1667 in females over the same period) suggested to some that the incidence of oral cancer was increasing, and that changes in social habits may be implicated. The possibility that the increase might be due to 'nicotine poisoning' was thought to be worthy of investigation.[83]

On the other side of the Atlantic, fresh alarm about the supposed increase of cancer was raised in 1913 by Frederick Hoffman, statistician of the Prudential Insurance Company of America. In an address on 'The Menace of Cancer' delivered before the American Gynecological Society in May 1913, Hoffman claimed that the mortality rate from cancer in America was rising and that no improvement in diagnosis could explain it. He was especially concerned about the dangers of cancer to women, although the statistics he presented indicated that the disease was increasing at a faster rate in males than in females.[84]

Hoffman’s analysis of mortality from cancer throughout the world, published in 1915, aimed to provide further evidence that the disease was not only becoming more prevalent, but that it also posed a greater threat to Western civilization than tuberculosis.[85] As well as furnishing a mass of data tending to show an almost universal increase, Hoffman examined the cancer figures of Frankfurt am Main in order to prove his case. Using the figures for 1906–13, he showed that the cancer mortality for males had increased in every group of organs, both accessible and inaccessible, with the exception of the respiratory organs. In women cancer of the respiratory organs and of the skin had decreased, but cancer of the other groups, including the reproductive organs, had increased. Thus the most recent data did not confirm the earlier conclusion that the increase in cancer was only apparent.

Hoffman’s conclusions were vehemently attacked in Britain by Ernest Bashford, who drew attention to the chequered history and ‘very backward’ state of vital statistics in the United States.[86] Registration of births and deaths across this vast territory was imperfect and the quality of the reports published by the several states was so uneven as to render many of them ‘nearly valueless’, he claimed in an article published in the *Lancet* for 1914.[87] Bashford regretted that a statistician of Hoffman’s stature ‘should have been so incautious in his statements alike of facts and in the deductions drawn from unreliable data’: based on ‘figures and not on statistics’, his conclusions were more likely to cause undue public alarm, than to achieve the ‘many practical benefits which accrue from accurate vital statistics’.[88]

The picture became more confused than ever during the 1930s as the official statistics of cancer mortality in Britain since 1900 revealed a sharp rise in the mortality from cancer of the prostate (365 per cent). During the same period cancer of the ovaries and of the fallopian tubes showed a 120 per cent increase, while breast cancer mortality was up by a more modest 23 per cent. Deaths from uterine cancer on the other hand had actually declined by 17.5 per cent.[89] Commenting on these figures, the Chief Medical Officer to the Ministry of Health George Newman expressed some doubt that better diagnosis and certification on their own could explain the figures:

> One would not expect diagnostic methods to affect one sex to a greater extent than the other, so that it may be said that part of the increased mortality which is affecting males more than females, and certain organs more

> than others, suggests – though no more – that changes in incidence have occurred.[90]

During the interwar period, cancer statistics in other countries also challenged the belief that cancer was a 'female' disease. In 1925, for example, Swiss and Norwegian data showed that malignant disease in both countries was equally distributed between the two sexes. The figures provoked a puzzled response in Britain: 'We have been told for so long and by so many authorities that cancer is much more frequent in women than in men', the *Lancet* observed in 1925, 'that we are inclined to regard as unorthodox and heretical the view that the sexes suffer equally in this matter'.[91]

Yet women's cancers continued to be at the centre of medical and public health attention. This concern was arguably justified by rising rates of breast cancer death. But rates of mortality from cervical cancer were falling, and they continued to fall during the next two decades.[92]The continuing concern with cervical cancer can be attributed, at least in part, to the emergence of cancer control policies based on early detection of tumours and an emphasis on malignancies that were more 'accessible' for diagnosis and treatment. But medical and public health interest in cervical cancer was also generated by changes in the status of the disease. By the early twentieth century, the public image of cervical cancer was that of a disease transformed by improvements in diagnostic technique and advances in treatment. Similarly to breast cancer, cervical cancer held up the promise of curability through early detection and timely intervention: a reputation established despite much evidence that malignant disease could not be permanently eradicated, no matter which organ it affected.

NOTES

1. Walshe, *The Nature and Treatment of Cancer*, pp. 152–3.
2. Moscucci, *The Science of Woman.*
3. Jamieson, 'Sex, in Health and Disease', p. 145.
4. Tanchou, *Recherches sur le traitement médical des tumeurs cancéreuses du sein*, p. 356.
5. Ibid., p. 274 (translation mine).
6. Walshe, *The Nature and Treatment of Cancer*, p. 95.
7. Olby, 'Constitutional and Hereditary Disorders'; Rosenberg, 'The Bitter Fruit'; Waller, 'The Illusion of an Explanation'.

8. Szabo, *Incurable and Intolerable*, pp. 15–36.
9. Copland, *Dictionary of Practical Medicine*, vol. 1, p. 285. See also Walshe, *The Nature and Treatment of Cancer*, p. 168.
10. Paget, *Lectures on Surgical Pathology*, vol. 2, p. 529.
11. Ackerknecht, ‘Broussais’; Braunstein, *Broussais et le matérialisme.*
12. The first English translation of Virchow’s seminal work *Die Cellularpathologie* was published in 1860; Virchow, *Cellular Pathology*. On the reception of Virchow in Britain, see Jacyna, ‘The Romantic Programme and the Reception of Cell Theory in Britain’; McMenemey, ‘Cellular Pathology’.
13. On the use of the ‘seed and soil’ metaphor with regard to phthisis, see Worboys, *Spreading Germs.*
14. Childe, *The Control of a Scourge*, p. 61.
15. Lever, ‘Statistical Notices of One Hundred and Twenty Cases of Carcinoma Uteri’, p. 270.
16. Macnaughton-Jones, *Practical Manual of Diseases of Women*, p. 513. Macnaughton-Jones quoted the German gynaecologist Schroeder. On the association of cervical cancer with excessive or licentious sexual activity, see Nolte, ‘*Carcinoma Uteri* and “Sexual Debauchery”’.
17. Boivin and Dugès, *Traité pratique des maladies de l’utérus*, pp. 9–10.
18. Hawkins, ‘Carcinomatous, or Cancerous Tumours’, on p. 997.
19. Tilt, *The Change of Life in Health and Disease*, p. 4. For a historical account of the cancer–menopause link, see Jasen, ‘Menopause and Historical Constructions of Cancer Risk’. See also Lock, *Encounters with Aging.*
20. [Pathological Society of London], ‘Discussion on Cancer’, p. 406.
21. Snow, ‘The Nature of Cancer’, p. 236.
22. Butlin, ‘Chimney-Sweeps Cancer’.
23. Moore, *Antecedents of Cancer*, p. 25.
24. Sieveking, *Medical Adviser in Life Assurance*, pp. 95–6.
25. Payne, ‘The Relation of Cancer to Life Assurance’, p. 20.
26. Williams, *Monograph on Diseases of the Breast*, p. 297.
27. Sinclair, ‘Malignant Diseases of the Uterus’, p. 659.
28. Childe, *Control of a Scourge*, p. 225.
29. See Smith, *Clean*, for a fine analysis of the interrelated histories of grooming, cosmetics, public health, ritual purification and preventive medicine.

30. Gilman, *Jewish Frontiers*, pp. 133–4.
31. Sorsby, *Cancer and Race*.
32. Handley, 'The Prevention of Cancer'.
33. Snow, *The Proclivity of Women to Cancerous Diseases*, p. 28. On Snow and ideas about the link between cancer and personal and emotional characteristics see Baines, 'A Model Patient'.
34. Ibid., p. 28.
35. Snow, 'Abstract of a Lecture', p. 236.
36. Snow, *The Proclivity of Women to Cancerous Diseases*, p. 57.
37. Cited in Sinclair, 'Malignant Growths of the Uterus', p. 330. The article in question was by Lapthorn Smith, 'A Change Needed in our Practice'.
38. Snow, *Clinical Notes on Cancer*, p. 50.
39. Sinclair, 'Malignant Diseases of the Uterus', p. 659.
40. Worboys, 'Unsexing Gonorrhoea'.
41. Sinclair, 'Malignant Diseases of the Uterus', p. 659.
42. Ibid., p. 661.
43. Williams, *Uterine Tumours*, pp. 260–2.
44. Hurdon, *Cancer of the Uterus*, p. 12; Stocks, 'Studies of Cancer Death Rates', p. 290.
45. Haviland, *Geographical Distribution*.
46. See the obituaries published in *The Lancet* and in the *British Medical Journal*: 'Obituary: Alfred Haviland MRCS'; 'Obituary: Alfred Haviland MRCS'.
47. On disease mapping, see Barrett, *Disease & Geography*; Gilbert, 'Pioneer Maps'; Koch, *Cartographies of Disease*; Koch, *Disease Maps*.
48. Haviland, *Geographical Distribution*, p. v. On Acland's mapping work, see Gilbert, 'Pioneer Maps', pp. 179–82.
49. Haviland, *Geographical Distribution*, p. 91.
50. Ibid. On malaria see Worboys, 'From Miasmas to Germs'.
51. Haviland, *Geographical Distribution*, 2nd ed., pp. 318–19.
52. Barrett, *Disease & Geography*, p. 330.
53. '[A Review of] Geographical Distribution of Heart Disease'.
54. Snow, 'The Geological Theory of Cancer'.
55. 'Obituary: Thomas Law Webb'.
56. Pearson, 'IV. On Cancer Houses'; Pearson, 'On the Appearance of Multiple Cases'.
57. Marks, '"Until the Sun of Science"'.

58. Butlin, ‘Address on the Investigation of the Causes of Cancer’; Butlin, ‘Report on Inquiry No XIII’.
59. Haviland, *Geographical Distribution*.
60. Barrett has suggested that bacteriology caused the demise of medical geography in the early twentieth century. Yet Haviland’s work demonstrates that germ theories of disease could be (and were) easily incorporated into the geographical framework. See also Numbers, who argues that ‘place’ continued to be significant in the study and prevention of disease. Numbers, ‘Medical Science before Scientific Medicine’.
61. Haviland, *Geographical Distribution*, pp. 317–18.
62. Brand, ‘The Aetiology of Cancer’, p. 240.
63. See Darmon, *Les cellules folles*, pp. 141–9 *passim*; van Helvoort, ‘A Dispute over Scientific Credibility’.
64. See e.g. Nason, ‘Cancer Houses’; Campbell, ‘Cancer Houses’; ‘Cancer Houses: an Unsolved Riddle’, p. 5; ‘Cancer Houses: Need for a National Inquiry’.
65. See e.g. Parkes and Kenwood, *Hygiene and Public Health*, p. 562.
66. D’Arcy Power, ‘The Local Distribution of Cancer’. Power thought that the host may be either a plant or an animal.
67. Sambon, ‘The Elucidation of Cancer’.
68. Bashford, ‘Cancer Areas and Cancer Houses’.
69. Contemporary Medical Archives Centre [CMAC], Wellcome Library, SA/CRC/N.1/1. Such fears were still alive and well in the early twenty-first century: see e.g. Moonan and Kelly, ‘Death Row’.
70. Cited in Darmon, *Les cellules folles*, p. 147. See also Brand, ‘Aetiology of Cancer’, p. 241.
71. Löwy and Gaudillière, ‘Disciplining Cancer’.
72. *Forty-Seventh Annual Report of the Registrar-General*, pp. xvii–xviii.
73. *Forty-Sixth Annual Report of the Registrar-General*, p. xviii.
74. *Fifty-Second Annual Report of the Registrar-General*, p. xiii.
75. Snow, *Clinical Notes on Cancer*, p. 28.
76. Williams, *The Natural History of Cancer*, p. 58.
77. Williams, ‘The Prevalence of Cancer’.
78. Moore, *Antecedents of Cancer*, p. 40.
79. Morris, ‘Editorial’, p. 369.

80. King and Newsholme, 'On the Alleged Increase of Cancer'. See also Newsholme, 'The Statistics of Cancer'. On Newsholme, see Eyler, *Arthur Newsholme and State Medicine*.
81. Williams, 'The Prevalence of Cancer', p. 446.
82. Muirhead, *Causes of Death*, p. 13.
83. 'Sex Mortality from Cancer (Editorial)'.
84. Hoffman, 'The Menace of Cancer'. On Hoffman see Sypher, *Frederick L. Hoffman*.
85. Hoffman, *The Mortality from Cancer*.
86. Bashford, 'Fresh Alarms', p. 379.
87. Ibid.
88. Ibid., p. 381. Hoffman promptly responded by mounting a strong defence of American vital statistics and rubbishing Bashford's paper; Hoffman, '"The Menace of Cancer"'.
89. 'The State of the Public Health'.
90. Quoted ibid., p. 637.
91. 'The Sex Incidence of Cancer'.
92. The figures are taken from Hurdon, *Cancer of the Uterus*, p. 2. Death rates from uterine cancer continued to decline in the 1940s and 1950s.

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CHAPTER 3

The Making of a 'Hopeful' Cancer

In a study of lung cancer, historian Carsten Timmermann uses the term 'recalcitrant' to define the identity of a number of malignancies which still defy medical attempts at a cure.[1] Lung cancer is undoubtedly the most visible of the recalcitrant cancers, but there are others with a similar history of failure and disappointment: for example, liver and pancreatic cancer. Cervical cancer can be said to lie at the other end of the spectrum. Widely thought to be preventable with effective screening, treatment of pre-cancerous lesions, and vaccination against Human Papilloma Virus (HPV) infection (now regarded as a major risk factor for cervical cancer), the disease is also deemed to be potentially curable if discovered at an early, treatable stage.

The emergence of this view has been widely linked to developments in the late nineteenth century: the belief that cancer was a 'local' disease of cells and the development of new 'radical' operations that held the promise of curability through early surgical intervention. In this chapter, I examine how this belief was established, despite a century-old story of false promises and disappointed hopes about the surgical cure of uterine and other cancers. I begin by exploring nineteenth-century understandings of cancer's 'incurability' and go on to explore the long and controversial history of surgical approaches to the treatment of uterine cancer. I show that radical surgery for uterine cancer did not, in fact, work as gynaecologists had anticipated. Although it did serve to alleviate distressing symptoms

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and prolong life in those patients who survived the operation, it did not produce the hoped-for 'cure'. The transformation of cervical cancer into a 'curable' disease, I argue, was not based on reality, but on the production of ideas about potential, though not yet proven, therapeutic efficacy.

Uterine Cancer in the Nineteenth Century: A Hopeless, Fatal Disease

Nineteenth-century practitioners wrote with great pathos and compassion about the plight of women suffering from uterine cancer, frequently admitting to feelings of hopelessness, helplessness and frustration whenever they were faced with a case of malignant disease of the uterus. In the first volume of his *Lectures on the Diseases of Women*, published in 1858, London obstetrician Charles West could not help remarking that

> in the study of the diseases which have hitherto engaged our attention, we have never entirely lost a sense of hopefulness. Either medicine might cure the ailment, or surgery might remove it; or at the very worst, so much might be done to retard its progress … In passing now, however, to the investigation of the malignant diseases of the womb, of *cancer* and its allied disorders, we shall find but few of those mitigating circumstances which lessen the darkness of the picture in the case of many other incurable affections.[2]

Nearly thirty years later, the French author of an MD thesis on uterine cancer admitted that 'despite so many efforts, boldly undertaken by the surgeons, and patiently kept up by the physicians, we are hardly more advanced than the contemporaries of Hippocrates'.[3]

Medical pessimism about uterine cancer was rooted in clinical experience: the disease was usually incurable at the time of diagnosis. This meant that it could not be eliminated by any means, either surgical or medicinal. Advanced uterine cancer was a terrible disease, characterized by severe pain, foul-smelling discharges and haemorrhages so profuse as to leave the patient utterly prostrate. In some cases the destruction of tissue led to the formation of a fistula – an abnormal connection between the vagina and the bladder or rectum – which let urine or faeces pass into the vagina. The actual cause of death in most cases was cachexia, a wasting syndrome that causes people with tumours to become anorexic, weak and fatigued. In most cases of uterine cancer, palliative treatment was all that the art of medicine could offer.

The awfulness of the disease was compounded by limited care facilities for sufferers.[4] For much of the nineteenth century the great majority of cancer sufferers were treated at home. This was manageable for the better off, who could afford to pay for nursing care, repeated visits from the doctor and expensive pain-relieving drugs, but not for the majority of the population. Those accepted in the care of the parish as paupers could apply for admission to a poor law infirmary, where levels of care for cancer cases were deemed to be unacceptable even by contemporary standards.[5] The 'respectable poor' fell foul of hospital policies which restricted admission to cases deemed to be curable (the Middlesex Hospital in London was the only voluntary hospital that accepted cancer cases, no matter how advanced). The first specialist women's hospital, founded in London in 1844, also excluded cancer cases when it first opened its doors to patients. The policy changed in 1869, when early cases of carcinoma of the cervix were allowed. In urban areas, those turned away from the hospitals as incurable were often able to receive medical attention from dispensaries and the out-patient departments of the voluntary hospitals. Out-patient services played an invaluable role in the provision of pain-relieving medications – a core component of palliative treatment.

In 1852 Dr William Marsden founded the London Cancer Hospital to fill what he felt to be a conspicuous gap in the provision of care for cancer sufferers. Figures published in 1874 revealed that, since the foundation of the hospital, female out-patients had outnumbered males by a ratio of 5:1, while the number of female in-patients had been three times higher than that of males. The large majority of women patients suffered from tumours of the breast (5952), and there were 1603 cases involving the 'special parts'. The most frequently treated cancers amongst men were those of the face and neck (819), followed by cancer of the tongue (539). Cancer of the penis and testicles accounted for only 162 of the male cases.[6] The statistics also showed that nearly a third of the cases were in the ulcerative and incurable stage of the disease.

Homes for the dying were established in various countries in the second half of the nineteenth century, some of them having a particular emphasis on the care of poor people suffering from incurable cancer. Rooted in religious and philanthropic concerns, these institutions were the work of pioneering women: they were part of the increasingly common tendency for middle-class women to engage with charitable work amongst the poor, sick and disadvantaged.[7] Attending physicians offered help and support with the management of distressing symptoms, but the routine and daily care was the preoccupation of nurses, many of whom were in religious orders. The main aim was to enable patients to have a ‘good death’, and safe passage to eternity.

The Meanings of Incurability

The observation that uterine cancer was usually incurable at the time of diagnosis did not necessarily mean that the disease was *inherently* incurable, however. In an insightful account of chronic disease in nineteenth-century France, Jason Szabo emphasizes that writers on cancer distinguished between several different forms of ‘incurability’: natural, medical and surgical. Everyone agreed that cancer was naturally incurable, but there was considerable debate as to whether it was surgically or medically (in)curable.[8] Competing visions of (in)curability can also be traced in the English medical literature of the time. Debates about the treatment of uterine and other cancers reveal significant differences of opinion about the nature of the disease and what Szabo calls ‘the semantics of incurability’.

The view that malignant disease was *inherently* incurable was frequently heard in discussions about dangerous operations like cervical amputation and hysterectomy. Some practitioners cited the frequency of recurrences after apparently successful treatment to argue that cancer was incurable by any means, either medical or surgical. They thus dismissed reports of ‘cures’, claiming that any alleged cure was the result of misdiagnosis. A corollary of this view was that risky treatments aimed at eradicating the disease were unnecessary and ultimately futile. Most surgeons and physicians agreed that risky surgery was legitimate if it offered the prospect of a complete cure. Practitioners who believed cancer to be inherently incurable thought that the dangers of surgery far outweighed the benefits.

More optimistic practitioners argued that the disease was not inherently, but *relatively* incurable. This position hinged on the belief that cancer ‘progressed’ through stages of increasing incurability. In the first half of the nineteenth century writers on uterine cancer divided the disease into two stages. The first commenced with a small, localized, hard tumour (‘scirrhus’). Scirrhous tumours could remain stationary for many years without causing any disturbance to the general system; eventually, though, they advanced to the second stage, in which they softened, ulcerated and degenerated into ‘true’ cancer (or ‘carcinoma’).[9] Many physicians and surgeons believed that it was possible to eradicate a scirrhous tumour. Carcinoma, on the other hand, was resistant to treatment and ultimately fatal. The word 'treatment' is used advisedly here, since 'cures' of cancer were claimed not only by advocates of ablation by the knife, but also by supporters of medicinal therapies. Cancer expert Walter Walshe, for example, asserted that the results of medical treatment did not warrant 'the notion of the invariable incurability of the disease by medicinal means at any stage of its progress … Testimony … is not deficient to the fact that growths, cancerous in essence, may at an early stage be totally removed by a persevering use of certain internal and external remedies.'[10] Surgeon Spencer Wells expressed similar views in a lecture delivered in 1857. He proposed that the knife should only be used to remove advanced, ulcerated malignancies, with a view to palliate, rather than cure, the disease. Early, non-ulcerated cases were best managed by medicinal treatment: 'Growths, with all the characters of cancer, have occasionally disappeared under the influence of remedies', he said; 'others have remained completely dormant for many years, without affecting the health or shortening the life of the individual; and it is absurd to say that the disease was not cancerous in such cases because the patient recovered, or lived to old age unaffected by the local condition'.[11]

By the end of the nineteenth century the distinction between 'early' and 'advanced' cancer had been reformulated in terms of the anatomical spread of a malignancy and its implications for surgery: a case was deemed to be curable when there was a reasonable chance of removing the whole of the disease by operation. In the case of uterine cancer, this may have meant a vaginal or an abdominal hysterectomy. Broadly speaking, a malignancy that had spread beyond the limits of the uterus was thought to be incurable because it was also inoperable. In practice the distinction between 'early' (operable) and 'advanced' (inoperable) malignancies was far from clear-cut, because the condition of operability depended on the operator as much as on the patient: 'I know of surgeons who refuse to operate in any case of carcinoma of the cervix', German-born gynaecologist Emil Ries observed in 1911; 'others who will do only operations which have a low primary mortality; others again whom no amount of primary mortality can deter from the most desperate attempts. Each one of them has his own conception of operability, which, expressed in figures, would vary between zero and 80 per cent of all cases.'[12]

The notion of 'progression' was also compatible with the view that early treatment, though seldom curative, could arrest the disease, thus increasing life expectancy and improving quality of life. This view cut across divisions of opinion about the nature and origins of cancer. In 1836, for example, the French author of a treatise on uterine cancer asserted that the disease was incurable, insofar as the underlying diathesis could not be eradicated. Yet he also pointed out that it was possible to keep a scirrhous tumour in a quiescent state for many years, by removing any condition that might hasten its progress to full-blown cancer: 'That may not be a cure', he admitted, 'but it is at least a truce whose duration may be extended over a long enough period of time, so that the natural life-span is not shortened'.[13] Thirty years later surgeon Charles Moore, a supporter of Virchow's local theory of cancer, made much the same point in arguing the case for early and complete operation. The tendency for the disease to recur after excision, he said, constituted

> no ground for refusing to a patient the months or years of absolute health that an operation confers. To promise final exemption from the disease upon the removal of the first tumour would, in the present state of our knowledge, be unprofessional; it is no less so, in default of such a promise, to withhold from the patient the opportunity of temporary, and it may be long, respite by means of an operation.[14]

Thus with appropriate care, cancer could be transformed from a fatal disease into a clinically manageable chronic condition, enabling sufferers to survive until they died from some other cause.

The problem for practitioners at the more optimistic end of the spectrum was that they seldom had the chance to diagnose uterine cancer in its early stage. The standard narrative throughout the nineteenth century and beyond was that women presented late, owing to their natural reluctance to consult male physicians for a gynaecological complaint. Yet nineteenth-century accounts of uterine cancer also tell another story, of diagnostic uncertainty with regard to early-stage disease, and clinical dilemmas in its handling.

The Problem of Diagnosing 'Early' Uterine Cancer

Most nineteenth- and early twentieth-century medical writers acknowledged that doctors frequently failed to recognize an early malignancy of the uterus because the disease usually commenced in an insidious manner. London obstetrician Edward Rigby stated in 1857 that

> an accurate diagnosis of this disease in its early stages, would be indeed most desirable; but, from the nature of it, and of the organ which it involves, a medical man has seldom the opportunity of examining it at this period; and even if he had, the symptoms, at the best, are of an obscure and doubtful character.[15]

According to Robert Barnes, the diagnosis of early stage uterine cancer was beset with difficulties: ‘The opportunities of studying the disease at this stage are so rare that, even when seen, for want of knowledge of its characteristics, it may escape recognition’, he observed in 1873.[16]

Haemorrhage, particularly on sexual intercourse, was widely regarded as the most common presenting symptom. Yet other comparatively trivial gynaecological conditions could give rise to abnormal bleeding: for example, uterine polyps or fibroids. In a textbook published in 1913, gynaecologists Alexander Barbour and B. P. Watson emphasized that the diagnosis of gynaecological disease was difficult because symptoms were either non-specific or idiosyncratic: ‘the student will not have taken the history of many gynaecological cases before he finds that there is a certain sameness about them all’, they wrote. ‘The same symptoms are present in different diseases, and the same pathological conditions met in two patients have a different train of symptoms.’[17]

The next step in the diagnostic process was thus to gather further clues about the possible nature of the disease. The patient’s history enabled the doctor to identify any factor that might indicate a predisposition to the disease, based on prevailing views about its causation: for example age, parity, a family history of cancer, evidence of mental trouble, and so on. Next to the data obtained from the patient came those derived from physical examination. English physicians were generally wary of ocular inspections aided by the speculum, partly because they worried that it would violate women’s modesty, partly because they placed more importance on the ‘educated touch’: ‘In a case of suspected cancer, more will be learnt from digital examination than by the most careful use of the speculum’, Graily Hewitt asserted in 1868.[18] The speculum was sometimes recommended in doubtful cases. But even those who used the speculum in their practice emphasized that the visual appearance of the cervix could be deceptive. The late Victorian obstetrician William Playfair, for example, thought that ‘he would be a bold man who would venture to distinguish positively between certain changes in the cervix due to hyperplasia, laceration, & c., of a bad kind but perfectly benign, and the early stage of carcinoma’.[19]

Practitioners were more confident about their diagnosis if the vaginal portion of the uterus felt hard, irregular, friable and prone to bleeding under the exploring finger, or if there was excavation with hard, irregular edges. Fixation of the uterus was deemed to be the surest sign of malignancy: it indicated that the disease had invaded the parts in the immediate vicinity of the uterus, binding the tissues into an immovable mass. Advanced malignancies of the uterus were easy to diagnose, but the easier the diagnosis, the worse the outlook for the patient. Here, then, was a dilemma for the practitioner: late diagnosis cost lives, yet it was only by observing the progress of a case that a positive diagnosis could be made.

Faced with an uncertain diagnosis, early nineteenth-century practitioners tended to wait until the clinical picture was clearer before formulating conclusions. According to Edward Rigby, 'the practitioner dreads to decide the point at the early stage, and hopes on, naturally wishing to give the patient the benefit of every doubt'.[20] Graily Hewitt exhorted colleagues to suspend judgement in doubtful cases: 'Experience has shown that the best observers have been deceived in their prognosis … It is easy to decide too soon; by waiting a little, doubts are gradually dispelled.'[21] Such attitudes may appear paradoxical in the light of concerns about late presentation and late diagnosis, but they are understandable in a context where a clinically positive diagnosis was regarded as tantamount to a death sentence.

The Microscope Comes to the Aid (or Not)

The use of the microscope as an aid to the diagnosis of tumours dates from early nineteenth-century attempts to detect some peculiar cancer 'molecule' in the blood of sufferers. This was of particular interest to surgeons, who had jurisdiction over the treatment of 'external' tumours such as those in the breast: surgeons yearned to differentiate between benign and malignant tumours in order to spare patients a dangerous and mutilating procedure.[22] Efforts to identify a distinctive cancer molecule in the blood proved fruitless, however, and the attention subsequently shifted to the cellular structure of tumours themselves. In the 1840s Adolph Hannover, the Danish histopathologist, and Hermann Lebert, the leading microscopist in Paris, proposed that the presence of cancer in the organism was indicated by a distinct cancer cell, observable under the microscope.[23] This doctrine aroused at first great interest, but it was eventually rejected by most microscopists and by many surgeons, chief among them

Alfred Velpeau.[24] Virchow, too, denied the existence of specific cancer cells. Doubts about Lebert’s theory in France led to a dispute about the usefulness of the microscope itself in the diagnosis of cancerous tumours, which came to a head in a famous debate held at the Academy of Medicine in 1854–5. As La Berge describes, the outcome of this debate was that medical microscopy gradually became incorporated into Paris clinical medicine.[25]

Microscopic diagnosis of uterine malignancies was vigorously promoted in the 1880s by pathologist Carl Ruge (a nephew of Rudolf Virchow’s) and his colleague Johann Veit, a gynaecologist. Ruge was director of the pathological institute for gynaecology at the *Frauenklinik*, the gynaecological department established by Karl Schroeder at Berlin’s Charité Hospital. Schroeder was a pioneer of radical surgery for cervical cancer. In the late 1870s and early 1880s Ruge and Veit collaborated on a study of the results of high amputation of the cervix at the *Frauenklinik*. They showed that the clinical diagnosis of cancer could not be confirmed by microscopic examination in over half of the cases. Ruge and Veit concluded that gynaecologists should not operate on women with suspicious symptoms, unless they had carried out a preliminary biopsy. Nevertheless, Ruge himself, in a textbook on gynaecological diagnosis published in 1907, warned against sources of error in microscopic diagnosis. He also highlighted difficulties in the diagnosis of early malignant degeneration.[26]

In the late 1800s the emergence of a more aggressive approach to clinically doubtful cases led to wider use of the microscope as an aid to diagnosis. Greater reliance on microscopy was also fostered by the development of controversial radical surgery, as patients began to insist on further proof in the diagnosis of uterine malignancies, and advocates for surgery became anxious to demonstrate that cases ‘cured’ by operation were indeed malignant.[27] But many practitioners continued to express doubts about the value of the microscope in the diagnosis of cancer, partly because histological analysis (based by then on the identification of proliferative changes in the tissues) did not consistently predict the future behaviour of a tumour.[28] Some practitioners thought that claims about the importance of the microscope were exaggerated, since pathologists themselves disagreed about the interpretation of microscopic findings. Others warned that over-reliance on laboratory evidence might divert attention away from vitally important clinical clues.[29]

The chief anxiety for practitioners, however, was that cutting into cancer tissue might promote metastases. The origins of this belief are unknown.

According to Wright, one of its earliest proponents was the New York physician Arpad G. Gerster, who argued that surgery to remove cancer might actually facilitate its spread.[30] Surgical dissemination of cancer cells seemed plausible, as many patients did die of recurrences shortly after excision. Thus the idea that biopsies were dangerous quickly gained wide acceptance in the late 1800s. Some surgeons rejected biopsies altogether, arguing that all suspect lesions should be treated as malignant to avoid the dangers of an 'incomplete' operation. Others asserted that exploratory incisions were allowable, provided they were immediately followed by a radical operation if the tissue sample revealed a malignancy.[31] According to the American gynaecologist Robert Greenough, even a delay of seven or ten days between exploratory incision and radical surgery could result in a fatal outcome. It has been argued that the danger of biopsy was more strongly accentuated in Britain and in the United States than in France.[32] There is evidence to suggest, however, that attitudes towards cancer biopsies in Anglophone countries were more complex than might appear at first sight. In 1917 Greenough carried out a survey to establish how doubtful cases were handled in American surgical practice. The study revealed marked inconsistencies in the way surgeons assessed the risks and benefits of biopsy in different sites. The general view was that a confirmatory biopsy was not necessary in cases of ovarian, prostate and testicular cancer. Many surgeons also expressed a preference for performing hysterectomy without a preliminary biopsy in suspected cancer of the cervix, and curettage for doubtful cancer of the body of the uterus. Surgeons were more likely to need the reassurance of the pathologist if the treatment caused significant mutilation and impairment of function, however. As Greenough explained, 'when it comes to such mutilating operations as those for radical cure of cancer of the tongue, or jaw or larynx … we most of us want the support of a pathological report before the operation is undertaken in doubtful cases; and yet the principle is the same, and the danger of the exploratory incision is probably just as great'.[33] Critics of radical operations on women frequently condemned this surgery as 'mutilation', but it is clear from Greenough's survey that most American surgeons did not deem the excision of the uterus and ovaries to be as mutilating as the excision of the tongue, jaw or larynx – nor did they regard the removal of testicles and prostate as particularly problematic.

In an effort to avoid the dangers associated with the two-stage process, methods of intra-operative diagnosis were developed from the end of the nineteenth century onwards. The most studied from the historical point of view has been the frozen section, a technique originally developed for examination of post-mortem tissues.[34] Other competing methods appeared after the Great War, including the 'wet film' technique developed in the 1920s by Leonard Dudgeon (a pathologist) and Vincent Patrick (a surgeon), of St Thomas' Hospital in London. More about this method will be said in Chap. 6, where its application to the detection of early gynaecological cancer will be examined.

'Early' Uterine Cancer and Surgical Curability Before 1860

The first attempts to extirpate or destroy 'early' localized malignancies of the cervix can be traced back to the anatomico-pathological localism of the early nineteenth century.[35] Particularly in continental Europe, this approach generated surgical interest in both partial and total excision of the uterus. Surgical activists claimed that excision of early stage tumours was potentially curative because it permanently eradicated the disease. It was indeed in this sense that the expressions 'radical' and 'operative' cure first became associated with surgical procedures such as partial and total extirpation of the cancerous uterus.[36] The term 'radical' served to distinguish those operations that were undertaken with curative intent from other surgical procedures or medical treatment carried out to palliate disease symptoms. Thus in 1835 the London obstetrician Francis Ramsbotham introduced a discussion of partial and total extirpation of the cancerous uterus by saying: 'Hitherto I have spoken only of palliative treatment; but in consequence of the invariably fatal nature of the affection we are considering, attempts have been made to effect a radical cure, both by amputation of the diseased neck, and by excision of the whole organ.'[37] The use of the term 'radical' in connection with cancer surgery also alluded to the centuries-old belief that cancer was a growth with many roots: thus if one removed both the visible tumour and the tissue that might contain invisible extensions of the malignancy (or, if possible, the entire organ containing the disease), there would be a better chance of preventing recurrences and permanently curing the disease.[38] In modern surgical parlance the term has become synonymous with extreme surgery, in which large amounts of normal tissue are removed along with the tumour, but it must be emphasized that in the early 1800s 'radical' operations were relatively limited in scope.

The first radical operations for cervical cancer – partial and total extirpation of the uterus – date back to the early 1800s. In 1801 Professor Frederick Osiander, of Göttingen, succeeded in excising the cervix by paring away the diseased portion after pulling down the uterus with ligatures. Osiander performed the operation twenty-five times between 1801 and 1816, but the occurrence of formidable and, in some instances, fatal haemorrhages deterred most of his contemporaries from following his example.[39] It is worth noting that in the early nineteenth century haemorrhage was not necessarily regarded as a bad thing: many practitioners accepted the theory, promulgated by François Joseph Victor Broussais, that bleeding was therapeutic because it relieved inflammation. Excessive bleeding was a hazard, however, as surgeons were later to appreciate.

The next to try out amputation, with a similarly unsuccessful result (the patient died eight days after operation), was Johann N. Rust, chief surgeon at the Allgemeines Krankenhaus in Vienna. The operation was subsequently introduced into France by the distinguished surgeon Guillaume Dupuytren, head surgeon at the Hôtel-Dieu in Paris. Between 1815 and 1820 it enjoyed something of a vogue in Paris, as a number of top surgeons hastened to imitate Dupuytren's example. Ann Carol has suggested that French enthusiasm for amputation can be partly attributed to the introduction of the speculum, a new instrument which enabled practitioners to visualize the slightest changes in the morphology and colour of the cervix. According to critics, advocates of the speculum tended to pathologize everything they saw through the instrument, resorting to intervention when a conservative approach would have been more appropriate.[40]

In 1825 Jacques Lisfranc, Dupuytren's self-declared rival, began to practise amputation. Ambitious and energetic, Lisfranc set out to make the operation his own: by 1834 he had totted up 99 operations and 84 'cures'. As early as 1828, though, doubts about Lisfranc's practice of amputation began to surface in a number of countries, including France and Britain.[41] Critics questioned not only the safety of the procedure, but also the nature of the cases operated upon. It was alleged that Lisfranc had performed amputation for benign pathologies of the cervix. This implied first, that he may have claimed cures in cases that were not true cancer, and second, that he may have performed a needless, and sometimes fatal, operation. The controversy reached a climax in 1836, when Jean-Hyppolite Pauly, a former pupil, published a textbook on women's diseases in which he claimed that Lisfranc had overstated the number of amputations performed, and falsified the results.[42] In his defence Lisfranc argued that all his patients presented with symptoms consistent at least with a diagnosis of scirrhus, and that he only resorted to surgery when other methods of treatment had failed. Around 1833 he started to limit amputation to a few selected cases, however, and in the late 1830s he abandoned the operation altogether. He justified this remarkable *volte-face* by claiming that sufferers were coming forward at an earlier stage of the disease, when cauterization was effective. Towards the end of his life, Lisfranc appeared eager to see surgery progress with caution. He adopted an aphorism inspired by John Hunter, which was inscribed on this tombstone after his death: 'If surgery is brilliant when it operates, it is even more so when it cures patients without loss of blood or mutilation.'[43]

In England sporadic attempts to perform amputation were reported in the medical press from the late 1820s.[44] Following Pauly's exposé, however, most British practitioners regarded amputation with great suspicion. Commenting on the case, the *Lancet* stated in1836 that the 'facts' were 'sufficient to determine at one and the same time the therapeutic value of M. Lisfranc's operation, and the moral reputation of its author'.[45] Fleetwood Churchill, the Irish obstetrician, warned that 'the exposure of such mis-statements is a striking lesson to all who, in order to make a reputation, are ready to forsake the path of honour and truth'.[46] Edinburgh obstetrician James Y. Simpson could not recommend the procedure, despite performing it himself with success in a case of cauliflower-like growth of the uterus.[47] Unlike most of his colleagues, though, he regarded the case pro or against amputation as not proven.[48] An advocate for the 'numerical method' proposed by the French physician Pierre Charles Louis, Simpson looked to statistics as a means of setting controversial medical innovations on secure, rational grounds.[49] As far as he could see, it was impossible to quantify the benefits of amputation, as the published data were both insufficient and unreliable.

A substantial number of practitioners interpreted Lisfranc's dubious statistics as confirmation that true cancer of the womb was incurable. In 1843 a reviewer of Lisfranc's *Clinique Chirurgicale* asserted that the author had been wrong in thinking that cancer of the uterus was surgically curable: 'who is there believes, that the number of cases of *genuine cancer of the uterus* has been diminished materially by improvements in the mode of treatment of the disease?'[50] Charles West emphasized in 1858 that no treatment, either medicinal or surgical, had ever proved curative for uterine cancer. In a veiled reference to Lisfranc, he wrote:

> An attempt was made … to vindicate to surgery its share in the removal of this disease … Time and increased knowledge … have led us to unlearn much in which our predecessors had an unfaltering faith … We have found out … that the supposed triumphs of surgery in cutting short the disease … were for the most part, purely imaginary; and the trophies once displayed in our museums are now generally put out of sight, as the mementoes of a pathological blunder and a needless operation.[51]

In the first two decades of the century attempts were also made to remove the whole of the cancerous uterus. Osiander was probably the first to try out the vaginal approach in the early 1800s, but he gave up after a number of disasters. The first operation in England was performed in 1828 by James Blundell, the London obstetrician. The patient survived the surgery, but she died a year later of a recurrence.[52] Blundell tried the operation on three other occasions, and in all three cases the patient died. Vaginal hysterectomy was already established in English practice as a treatment for prolapse and retroversion, but total extirpation of the non-prolapsed uterus was generally regarded as too hazardous to become a viable treatment option. It was thus opposed even more vigorously than partial amputation.[53]

English attitudes towards surgery for uterine cancer can be explained, at least in part, by the fact that until the middle of the nineteenth century the management of this disease belonged to the obstetrician rather than to the surgeon. In the early nineteenth century obstetricians, whether they were general practitioners or practitioners who specialized in the subject and taught in medical schools, favoured a remarkably conservative style of practice. Obstetrical conservatism (in the sense of opposition to instrumentation and operative interference) had a wider professional dimension, in that it served to legitimate the claim that the care of women's reproductive health was a medical task. At a time when physicians rather than surgeons held the teaching posts and formed the elite, an emphasis on non-operative measures was useful as a means of claiming for obstetrics higher status as a medical specialty: until the late nineteenth century, all leading obstetricians were physicians, as were most of the authors of important textbooks of obstetrics and diseases of women.

Obstetricians sometimes resorted to other methods of ablation as an alternative to the knife: removal by ligature and cauterization. Both methods were less dangerous than ablation by the knife, but they were generally thought to be of limited efficacy in cancer cases. The ligature was employed routinely in the treatment of uterine polyps, and it was used occasionally to destroy cauliflower growths.[54] Cauterization with corrosive pastes and hot irons was sometimes recommended in cases of ulcerated cancer.[55] Cauterization was not an easy option because it was extremely painful for the patient, and time-consuming for the practitioner. Furthermore, the method had a somewhat dubious reputation in England, largely because caustic pastes were commonly used by lay 'cancer curers'. A thorn in the side of the regular profession, these individuals were notorious for claiming success in cases that practitioners had abandoned as hopeless.[56]

Therapeutic approaches to uterine cancer before 1860 relied chiefly on a combination of hygienic measures aimed at improving general health (a mild but nutritious diet, moderate exercise, pure air and scrupulous cleanliness); internal remedies to strengthen the constitution, slow down the progress of the disease and restore the blood to a healthy state (tonics, antacids, narcotics and 'alteratives'), and external remedies to lower the nutrition to the parts and/or to promote the absorption of the tumour (chiefly by the application of leeches to the groin, abdomen and pudenda).[57] The aim was to slow down the progress of the disease and, hopefully, produce a cure.

By the middle of the nineteenth century, change was in the air. Surgery was rising in status, and surgeons were beginning to expand their repertoire. The controversial development of ovariotomy, a dangerous operation widely condemned by obstetricians, and surgeons themselves, marked the beginnings of the surgical conquest of the female reproductive system, presaging the transformation of 'women's diseases' into the surgical specialty of 'gynaecology'. Obstetricians themselves began to adopt an increasingly interventionist approach, both to the conduct of labour and to the treatment of women's diseases. 'Operative obstetrics' became fashionable in the last quarter of the century, particularly when Caesarean section, an operation so unsafe at the beginning of the century that hardly any practitioner would contemplate it, became a standard technique. By the late 1870s leading obstetricians were also beginning to challenge surgical monopolies over the performance of ovariotomy in hospital practice, claiming that the splitting of cases into a medical and a surgical part was illogical and detrimental both to the interests of patients and to the progress of medical science. Those who fought for the obstetrician's 'right' to operate in ovariotomy cases were not amused when surgeons retorted that gynaecological practice was purely surgical: thus any obstetrician who 'posed' before the public as a physician, yet practised surgery, was guilty of professional misconduct.

The Second Wave of Surgical Activism, c.1860–1880

Surgical development in the second half of the nineteenth century was helped by a number of technological innovations, beginning with the introduction of anaesthesia in 1846. Before the era of anaesthetics, lack of pain-relief inhibited surgeons from using operations as a first-line treatment, and caused many patients to refuse surgery. The possibility of operating on an unconscious patient in place of a writhing, screaming creature made intervention more acceptable. Patients became readier to consent to surgery, in the expectation of a painless operation. This combination of factors enabled surgeons to expand their repertoire and offer more complex and protracted procedures than would have been tolerated by sensible patients.[58]

At the same time, surgeons stepped up their efforts to improve the safety of operations. 'During the 1850s 'bloodless' surgery became the order of the day as surgeons began to appreciate the importance of conserving every drop of blood.[59] The novel emphasis on 'bloodless' operations stimulated the development of new instruments and techniques. In the early 1850s Edouard Chassaignac, surgeon at the Laboisière Hospital in Paris, invented an instrument that was to have a major impact on the treatment of uterine cancer: the *écraseur linéaire* ('linear crusher'). Intended as a replacement for the knife, Chassaignac's *écraseur* applied the haemostatic properties of the ligature to the removal of benign tumours, malignancies and haemorrhoids.[60] The instrument consisted of a flattened steel tube, containing two rods of the same metal. The extremities of a chain were attached to the end of each of these rods. The linked, looped chain would be placed around the tumour and gradually tightened by means of a ratchet movement, until the links were inside the instrument. The procedure cut off the blood supply to the tumour, which then fell off with minimal loss of blood.[61]

Surgeons were the first to adopt the *écraseur* in England. By the late 1850s a number of cases had been reported in which the instrument had been used to remove a variety of benign and malignant tumours – including a malignancy of the cervix.[62] Chassaignac's method appealed to surgeons not only because it promised to prevent unnecessary bleeding, but also because it did away with the knife, an instrument associated with mutilation and death, rather than healing. Thus in a report of the first amputation undertaken in London with the aid of the *écraseur* (to remove an epithelial cancer of the scrotum), an anonymous writer made this revealing comment: 'The man having been placed under chloroform, no pain was caused; while the absence of knives, forceps, etc., had an effect more easily perceived than described.'[63] The author went on to say: 'With the aid of chloroform, it [the *écraseur*] seems the very perfection of surgery, if perfection be allied to absence of bleeding and absence of pain.'[64]

Chassaignac received wide recognition for his invention, including the prestigious Montyon prize conferred by the French Academy of Sciences (1864).[65] Unfortunately, though, the use of the *écraseur* in cases of cervical cancer did not turn out to be as safe as surgeons had hoped. First, it did not entirely remove the danger of haemorrhage.[66] Second, it introduced a new hazard: when applied to the cervix, the chain could cause lacerations of the peritoneum and bladder.[67] Some practitioners thus turned to another 'bloodless' method for the removal of tumours, developed in the 1850s by the German surgeon Albrecht Middeldorpf: the galvano-cautery. Similarly to the *écraseur*, the galvano-cautery was intended as a substitute for the knife, but it applied the principle of cauterization to prevent haemorrhages. The instrument consisted of a platinum wire hoop heated by passing a current of electricity through it. The wire was placed around the tumour cold. After connection was made to the battery, the wire was gradually tightened, so as to burn through the tissue.[68] Many gynaecologists claimed that the galvano-cautery was not only safer, but also more precise and reliable than the linear *écraseur*. The equipment was expensive and inconvenient to carry about, though, so especially when operating in the patient's own home, as was customary in private practice, surgeons and obstetricians frequently had to content themselves with Chassaignac's instrument.

The expansion of surgery into the treatment of women's diseases accelerated during the 1860s. Decreasing rates of operative mortality gradually led to wider acceptance of ovariotomy. New operations were developed for the repair of vesicovaginal fistula and the treatment of sterility and dysmenorrhoea. Amputation became increasingly common not only for malignant, but also for benign conditions of the cervix, such as laceration and 'hypertrophic cervical elongation' (a diagnostic entity introduced to gynaecology in 1859 by the French surgeon Pierre Charles Huguier).[69] Surgeons and, increasingly, obstetricians, used the galvano-cautery, the chain *écraseur* and other variations of Chassaignac's original instrument to excise the cervix. They also used scissors and the knife, followed by the application of sutures, styptics and the cautery to arrest bleeding.

The view that uterine malignancies should be removed, if at all practicable, found a rationale in the theory that cancer was a local disease of cells. Obstetrician Robert Barnes, writing in 1873, asserted that the theory was 'a most hope-inspiring doctrine; one to which the clinical physician should cling as that which most encourages therapeutical research, and which alone holds out the prospect of ultimate triumph over the disease'.[70] It is worth noting that Virchow, the author of *Die Cellularpathologie*, stressed that the local theory of cancer did not necessarily imply ablation by the knife. Yet it was as an encouragement to surgeons that the theory was widely interpreted.[71]

In contrast to the previous wave of surgical activism, the second wave was stimulated not by the belief that excision may be curative, but by the view that patients who were operated on had a better prognosis than those who received no treatment. This belief began to gain momentum in the early 1860s, following the publication of a statistical analysis of the cases admitted to the Middlesex Hospital in London between 1853 and 1856. The author of the study, Septimus Sibley, was a brilliant mathematician who had entered medicine in 1848 as the result of a career change. The investigation covered a wide range of topics, from the age incidence of the disease, to its hereditary nature. One of its purposes was to evaluate the results of surgery. This section of the study was based on the data of mastectomy operations, since breast cancer patients formed the largest group of those who underwent cancer surgery at the Middlesex. Sibley showed that patients who had a mastectomy lived on average twenty-one months longer than those who were left alone, even when the operative mortality (4.8 per cent) was taken into account.[72] This finding was qualified with the caveat that patients who were operated upon may have had a better prognosis because they were usually selected from those who were in better health. The study may thus have failed to present a fair comparison of treated and untreated cases.

Sibley's chosen terms of comparison are interesting. It may have been of some significance that he was a close friend of Campbell De Morgan, one of the surgeons at the Middlesex Hospital. De Morgan was a champion of the local theory of cancer, and a leading advocate of early excision in all cancer cases. Whether Sibley was directly influenced by De Morgan is impossible to say, but it is interesting that his findings were unquestioningly interpreted as an endorsement of ablation. In 1860 Charles Hewitt Moore, one of De Morgan's colleagues and an advocate of early and 'complete' extirpation of breast cancer, used Sibley's statistics to argue that excision was permissible, both as a means of mitigating suffering and of prolonging life.[73]

During the 1860s obstetricians and surgeons began to justify cervical amputation on the grounds that patients lived longer after surgery than they did without it, despite the fact that the evidence at their disposal was mostly anecdotal: practitioners simply assumed that amputation was better than leaving the disease to run its course. A typical example is provided by Robert Barnes. In his *Clinical History of the Medical and Surgical Diseases of Women*, published in 1873, Barnes examined the question of prognosis in uterine cancer:

> Prognosis will be affected by treatment. For example, if the disease be allowed to run its course uninterrupted, the fatal termination will in many cases come at an earlier date than in those cases where judicious treatment has been adopted. It is difficult to set this comparative statement in figures. But a comparison of cases seems to justify certain deductions. Thus we take two cases of cauliflower excrescences, apparently chiefly limited to the vaginal-portion, and amputate as far as we can the diseased mass in one case, and avoid surgical treatment in the other. We may pretty confidently predict that in the second case haemorrhage, watery discharges, and general infection will destroy the patient in a few months. We may with equal confidence predict that, if the diseased mass be fairly removed, the destructive processes will be arrested for a time, and that the patient’s life will be prolonged.[74]

This shift in attitude is particularly striking in the writings of James Young Simpson. In the early 1840s Simpson was unable to pass judgement on amputation because he felt that the data available were unreliable. By 1863 there was a growing body of evidence about the risks and benefits of amputation – none of which was very encouraging, however. In a review of different methods, Simpson asked:

> Such being the drawbacks and dangers attendant on this operation, is it, you may ask, useful and advisable in any case to have recourse to it? To this question I unhesitatingly answer, that there are cases in which amputation of the cervix uteri is both a useful and a commendable procedure; for by means of it you can sometimes eradicate the disease; and oftener you can stay its progress for a time.[75]

The old surgical philosophy of radicality was far from dead, however. Its revival from the late 1870s onwards was mainly due to the work of

German-speaking surgeons at the leading edge of technological innovation. As Tröhler notes, in Germany cancer was an important subject at the meetings of newly founded surgical societies, and it was often selected as the main topic of congresses, with communications covering an ever-widening range of organs and organ systems.[76] Total eradication was the aim – an approach which sometimes ended in mutilating interventions. German-speaking gynaecologists pioneered new, more extensive surgery for uterine cancer. In Berlin Karl Schroeder introduced 'high' amputation, a procedure involving the excision of the cervix together with the lower part of the uterus.[77] Elsewhere in the German Empire, gynaecologists turned their attention to the ultimate goal of radical cancer surgery: the extirpation of the entire organ containing the disease.

The Revival of Total Abdominal Hysterectomy for Uterine Cancer

The first attempt to remove the whole of the cancerous uterus was made by abdominal section. In April 1877 Wilhelm Alexander Freund, Assistant Professor of Midwifery at the University of Breslau (now the Polish city of Wroclaw), read a paper at a meeting in Berlin of the Society of Obstetrics and Gynaecology, in which he described a new method of abdominal hysterectomy. Freund declared that extirpation of the whole uterus was 'the only rational cure' for uterine cancer.[78] The new method aimed to fulfil the requirements for abdominal operations, as set out by Hegar and Kaltenbach in their textbook of gynaecology: complete protection from both bleeding and injury, and effective management of the difficult abdominal wound.[79] Freund employed the techniques of haemostasis, and Lister's method of antisepsis, which he followed in meticulous detail. He also introduced other innovations, including the practice of tilting the patient to elevate the pelvis (twelve years before Trendelenburg described the position).[80] The patient, a sixty-two-year-old woman, survived the surgery, and she was still alive and well several years later. Unfortunately most of Freund's subsequent cases did not fare so well: despite his insistence on complete haemostasis and antisepsis, 70 per cent of the patients died, chiefly from violent and uncontrollable haemorrhages.

To understand the significance of this 'milestone' in the history of gynaecological surgery we must take a step back and look at another history intimately related to Freund's achievements: the development of abdominal hysterectomy for uterine fibroids. This began in the mid-1840s as a by-product of ovariotomy. The first operation was an unplanned procedure undertaken during elective surgery to remove cystic ovaries. In 1844 Charles Clay, the Manchester ovariotomy pioneer, operated on a patient expecting to find a large ovarian cyst. Confronted with a large fibroid uterus as well as a diseased ovary, he determined to perform a subtotal hysterectomy in addition to the ovariotomy.[81] The patient survived the operation but, according to Clay, she died two weeks later from 'inflammation' after falling out of her hospital bed.[82] Clay's next attempt at hysterectomy, in 1863, was deliberate. Fortunately the patient recovered, and she returned home cured a month later. In the meantime the operation had been attempted in America by Drs Walter Burnham and Gilman Kimball, of the Lowell Corporation Hospital in Massachusetts.[83] Similarly to Clay's 1844 case, the first American hysterectomy for fibroids (by Burnham in 1853) was an unplanned procedure undertaken during surgery for ovarian disease. The first deliberate, successful subtotal hysterectomy for fibroids in America was completed by Kimball at the end of 1853. The next phase of development between the mid-1860s and mid-1870s was due to surgeons who had made the techniques of abdominal surgery their special concern: Kimball in the United States; Eugène Koeberlé and Jules-Émile Péan in France; Thomas Keith, Knowsley Thornton, Spencer Wells and Lawson Tait in Britain.

Widely regarded as more dangerous than ovariotomy, hysterectomy for fibroids was justified on the grounds that it permanently cured sufferers from a potentially fatal disease. This assertion was fiercely contested by a number of practitioners, who claimed that fibroids could be successfully managed by medical, expectant, or milder surgical treatments. The Academy of Medicine of Paris formally condemned the operation in 1872. In Britain abdominal hysterectomy attracted criticism from a number of obstetric physicians. Thomas More Madden, for example, believed that most hysterectomy operations were unnecessary. In 1885 he condemned the frequency of both hysterectomy and ovariotomy as 'evidence of the spreading *cacoethës operandi* [uncontrollable desire to operate] prevalent among abdominal sectionists'.[84] These comments were aimed not only at the Birmingham gynaecologist Lawson Tait, the chief advocate of hysterectomy for fibroids in Britain, but also at the younger generation of obstetric physicians who were entering the new field of abdominal surgery in ever-increasing numbers.[85] Leading obstetricians were concerned about the high mortality of abdominal operations. Furthermore, there was widespread public unease about abdominal operations on women, which were frequently depicted as a form of 'human vivisection'.

British pioneers of hysterectomy were not insensitive to such criticisms. Thomas Keith, for example, abandoned the operation when the Parisian gynaecologist Georges Apostoli introduced an electric treatment for fibroids: 'It may seem strange to some that after the results I got in hysterectomy – results that almost made it justifiable – I should now begin to throw stones at the operation instead of trying still further to improve upon it', he asserted in 1889; 'and but for Dr Apostoli, I would now be doing so'.[86] Other surgeons introduced oophorectomy (the removal of healthy ovaries) as a safer alternative to hysterectomy: the procedure did not eradicate the disease, but it relieved symptoms by inducing an artificial menopause.

It is against the background of this debate that we must now consider the impact of Freund's hysterectomy. By 1883 there were 93 published cases, and 63 of these (67.7 per cent) had proved fatal.[87] High though it was, this mortality was approximately the same as for hysterectomy when undertaken for fibroids. Yet surgeons and obstetricians in most countries, including Germany, found it easier to justify abdominal hysterectomy for benign than for malignant conditions of the uterus. Anxieties about the uncertainty of cure tilted the risk–reward balance *against* hysterectomy in cases of uterine cancer. Obstetricians' initial response was that Freund's 'desperate' operation should be reserved for special cases. By the 1880s uterine cancer had been differentiated into cancer of the neck and cancer of the body of the uterus. According to most medical writers, abdominal hysterectomy was indicated in cases of sarcoma of the uterus (a group of malignant tumours that form in the smooth muscle or connective tissue of the uterus), where the disease was still confined to the body of the uterus. The method was thought to be contraindicated in other cancer of the body of the uterus, and in cases of cervical malignancy where the disease extended beyond the neck. This was because of the probability that the glands may be already affected. A malignancy that had spread to the lymphatics could not be eradicated by Freund's method: it was thus unethical to expose the patient to the very high risk of dying from the surgery. Cases in which the malignancy was confined to the neck of the womb could be managed by amputating the cervix instead.[88] In 1885 New York gynaecologist Henry C. Coe summed up the situation in a short paragraph:

> Freund’s operation may be dismissed in a few words … Two years ago its scope was considered as very limited, and now few surgeons would think of performing it, except in those rare cases of sarcoma or carcinoma, where the disease is strictly confined to the corpus uteri. In this country Freund’s operation is now as rare as resection of the pylorus – and quite as fatal in its results.[89]

In the meantime gynaecologists had begun to remove the uterus by the vaginal route. The revival of this method was due to Karl Pawlik, a Czech surgeon who reported his first case in 1880, and to a number of German gynaecologists, including Karl Schroeder, Robert von Olshausen and Karl Schuchardt. The main point in favour of vaginal hysterectomy was that it was less risky than the abdominal operation. Acceptance of the procedure was by no means automatic, however, as shall be seen in the next section.

A Question of Comparisons

The problem for practitioners was how the risks and benefits of vaginal hysterectomy should be assessed. In the early 1880s evidence as to its long-term efficacy was thin on the ground. An editorial published in the *British Medical Journal* for 1883 mentioned nineteen reported cases which were free from recurrence for periods ranging from three to twenty-four months, and fifteen cases in which the disease had recurred after an average of four months (all of these had proved fatal).[90] There were more extensive data about the mortality from the surgery itself, which was approximately 31 per cent, well above the rate for amputation, but well below the rate for abdominal hysterectomy. The primary mortality was also slightly above the rate for ovariotomy, an abdominal operation already accepted as a legitimate surgical procedure. Did all this make vaginal hysterectomy a justifiable procedure?

During the early 1880s this question became the subject of fierce debate on both sides of the Atlantic. Important discussions took place at the Obstetrical Society of London in 1883 and in 1885, and in the United States the issue was periodically discussed at professional meetings and conferences. Participants in this debate can be divided into progressives and conservatives. Members of the first group acknowledged that the mortality of vaginal hysterectomy was high as compared with amputation, but they sought to defuse professional anxieties about risk by emphasizing the potential for improvement.[91] The strategy used was to compare the mortality of vaginal hysterectomy with that of ovariotomy, despite the fact that the two procedures were undertaken for different indications, and that the methods were also different. Liverpool obstetrician John Wallace turned to the troubled history of ovariotomy in order to draw lessons about hysterectomy: 'Ovariotomy had a long and uphill struggle before it was finally accepted as one of the most brilliant operations in surgery', he asserted in 1883.

> The operation of extirpation of the uterus for uterine fibroids we are now in the midst of seeing established in legitimate surgery; and I hope there is the prospect that extirpation of that organ for cancer will also soon take its place upon an equal footing with operation for that disease in other parts of the body.[92]

Spencer Wells was confident that improved methods, more accurate diagnosis and earlier operation would produce better results, leading 'not only to a lower death-rate, but to a retarded recurrence and sometimes a complete recovery'.[93]

Advocates for hysterectomy used comparisons with ovariotomy to make another important point: the more skilful the surgeon, the better the results. An editorial published in the *BMJ* for 1883 stated that 'like ovariotomy', vaginal extirpation was 'progressively improving in its death-rate … In the hands of surgeons who have had the largest experience, the mortality has been still further reduced.'[94] Paul Mundé, the American gynaecologist, acknowledged that ovariotomy still presented quite a high mortality, but he emphasized that it was not so dangerous in the hands of 'specially dexterous or fortunate operators'.[95]

By focusing on the importance of skill and experience, advocates for hysterectomy were also able to turn failures into opportunities for improving outcomes. Speaking at the BMA's 1883 annual meeting, Dr W. R. Rogers of London remarked that, though generally unsuccessful, the operation had been successful in a few cases. This presaged 'greater success in the hands of operators who, guided and warned by the failures, might have greater success in the future at least'.[96] John Wallace took it for granted that better results would come from improvements in technique, arguing that the operative work of every surgeon was 'experimentally progressive'. Schroeder himself acknowledged in 1883 that the results of his operations were 'very bad', but he took heart from developments in other areas of gynaecological surgery: 'We certainly may hope that the method will follow the lead of the other large gynaecological operations, showing a better prognosis as fast as the technical methods become more perfect.’[97] In the meantime practitioners need not regard disappointing results as a source of opprobrium: ‘Let us bear in mind that the fate of these patients is such that, if only one out of twenty be radically cured, this ought to be considered as a good result, and as a consolation for many cases treated unsuccessfully.’[98]

Critics of vaginal hysterectomy found such arguments hard to swallow. Their main premise was that ovariotomy and vaginal hysterectomy were not comparable. Knowsley Thornton, the ovariotomy pioneer, argued that the excision of ovaries by laparotomy was justified, despite its risks, because it restored many patients to perfect health. Vaginal hysterectomy for malignant disease, on the other hand, was not justifiable, since no cancer patient was ever cured by radical operation: as far as Thornton was concerned, any cancer patient who was pronounced ‘cured’ was not a real case of malignancy at all.[99] In the United States, Dr Reeves Jackson of Chicago declared that vaginal hysterectomy for malignant disease had never saved a single patient from her ultimate fate.[100] Speaking at a meeting of the American Gynecological Society in 1885, Jackson asserted that only a ‘beggarly plea’ could be urged in favour of the operation: ‘that it may in the future not destroy so many, and may even save a life. But’, he went on to ask, ‘should this great and certain evil continue on the mere possibility – the almost baseless hope – that a trifle of good *may* follow?’[101] Jackson claimed that so-called ‘palliative’ methods were more effective, and less dangerous, than vaginal hysterectomy. As in debates about amputation and abdominal hysterectomy, pessimism about the curability of uterine cancer shaped critics’ perception of surgical risk. A number of surgeons also questioned the correctness of diagnosis in cases reported as ‘cured’. In England Lawson Tait firmly rejected hysterectomy for cancer, arguing that the primary mortality, owing to the nature of the surgery, ‘must always be heavy’, and that the few cases in which the disease did not recur were ‘clearly errors of diagnosis’.[102] Eugène Koeberlé, the French pioneer of abdominal and gynaecological surgery, similarly stated that those who recovered had no cancer and did not need operation; those who had cancer did not recover.[103]

Negative comments in Britain and France may have reflected not only scepticism about surgical curability, but also hostility to all things German, following the Prussian victory in the Franco-Prussian war of 1870–1. Not surprisingly, the most powerful anti-German sentiment was felt in France, particularly in Alsace-Lorraine which was Koeberlé's home. France lost Alsace-Lorraine to Prussia, and in 1871 the University of Strasbourg was refounded as a German institution. Berlin-born Adolf Gusserow was appointed to the Chair of gynaecology, and when he returned to Berlin in 1879 Wilhelm Freund was named to succeed him. It is not difficult to see how Koeberlé, who was known to be a staunch Francophile, may not have been too inclined to trust his German surgical *confrères*.

The debate about vaginal hysterectomy also revealed different approaches to the assessment of risk. Historian Ulrich Tröhler has analysed controversies about medical innovations, using a number of examples from the eighteenth through to the twentieth century. He identifies two main approaches to the assessment of risks and benefits. The first consisted in assessing whether the innovation, in its current form, did more good than harm to the patient and/or to society. The second consisted in reducing risk by making the intervention safer from a technical point of view.[104] Critics of hysterectomy were in the first camp. They were concerned to evaluate the outcome for patients in terms of 'advantages' and 'dangers' arising from the surgery in its current technical incarnation. Proponents of hysterectomy, on the other hand, were in the other camp. They focused on the safety of the new method and the potential for improving it by modifying operative techniques. The assumption was that the 'improved' method would give better results in the future until, ideally, it would produce only the intended beneficial effects.

During the late 1880s it was the first approach that figured more prominently in England. Most practitioners rejected vaginal hysterectomy as a dangerous and ineffectual procedure, preferring the milder course of supra-vaginal amputation. Eventually, though, the 'improvement-and-safety' approach prevailed, leading to wider experimentation with the method, and its final acceptance as a legitimate surgical procedure.

VAGINAL HYSTERECTOMY: A STORY OF UNFULFILLED PROMISE

Efforts to make vaginal hysterectomy safer for patients were stepped up in the late 1880s. Established techniques were modified in an effort to reduce loss of blood, improve the closure of wounds and minimize the risk of injury to the bladder, ureters and rectum. Surgeons became more careful about the selection of cases for operation; they also began to pay more attention to the pre- and post-operative care of those they deemed to be operable. In 1891 a review of the literature carried out by the American surgeon Franklin H. Martin showed a gradual lowering of the mortality, from 37 per cent in 1880, to 20 per cent in 1887. Martin's own enquiry revealed that the surgeons who had the largest number of operations to their credit also had the lowest average mortality. He concluded that the data proved what advocates for vaginal hysterectomy had been arguing all along: the operation was 'no exception to the rule, that with experience in operating comes proficiency and lowering of death rate'.[105]

It was on such hopes that the operation rapidly gained a firm foothold in most Western countries. In England a few practitioners continued to favour high amputation, but by the early 1890s the great majority recommended vaginal hysterectomy as the treatment of choice in cases of operable uterine cancer. In the United States surgeon E. E. Montgomery, of Philadelphia, went so far as suggesting that the procedure should not be limited to confirmed cancer cases: 'when the condition is one of doubt the patient should be given the benefit of the doubt and the organ removed', he asserted in 1889 at a meeting of the American Association of Obstetricians and Gynecologists.[106] Some practitioners indeed complained that the pendulum had swung too far. London obstetrician Dr F. B. Jessett, for example, stated in 1893 that the time had come to speak out against the 'wholesale performance' of vaginal hysterectomy.[107]

With increased experience also came disappointment, however, as gynaecologists realized that vaginal hysterectomy was no more effective at preventing recurrences than high amputation. Post-mortem examinations appeared to show that recurrences occurred in or near the scar, suggesting that either the operation had been inadequate, or that the wound had been contaminated during the course of the surgery. In an effort to solve these problems, surgeons introduced a number of technical improvements: (a) preparation of the cervix and vagina by curetting or cauterization, and (b) removal with the cautery (or other instrument that had not come in contact with the cancer) to prevent contamination of the wound; and (c) use of auxiliary incisions to improve access to the uterus and extend the operation to the broad ligaments, ovaries and fallopian tubes.[108] This approach culminated in 1901 with the development of Schauta's extended vaginal hysterectomy. The procedure was devised as a rival to Wertheim's hysterectomy (of which more later), but it was criticized because, unlike Wertheim's operation, it did not permit the removal of the lymphatics. At the same time, a few surgeons and gynaecologists in America and in continental Europe reintroduced 'total' abdominal hysterectomy (i.e., the excision of both the uterus and its neck) for cancer of the body of the uterus. Mixed vagino-abdominal and abdomino-vaginal methods were also developed to facilitate the removal of the uterus in cases where the vaginal route was too difficult.[109]

Despite all these efforts, the promise of surgery remained elusive. In 1897 the French gynaecologist Samuel Pozzi commented that 'it would be illusory … to talk about a definitive cure of uterine cancer … In my view hysterectomy is only a palliative treatment of more or less long duration.'.[110] The Belgian gynaecologist M. Kufferath commented in 1904 that he had never had a case of 'cure' either by abdominal or by vaginal hysterectomy.[111] Pessimism about the surgical curability of uterine cancer was not confined to the Old Continent. At a meeting of the Southern Surgical and Gynecological Association, for example, Dr V. Hardon of Atlanta confessed that he had 'lost all confidence in operative measures as a means of effecting a permanent cure'.[112]

This was dangerous talk. At a time of mounting concern about rising cancer mortality, admissions of defeat could only undermine public confidence in doctors' ability to stem the tide. The result, cancer surgeon Herbert Snow suggested in 1904, was that sufferers might be tempted to beat a path to the door of the quack: pessimistic views of cancer damaged the profession 'by imputing to it a wholly supposititious ignorance and impotence, and so playing into the hands of the quack', he warned.[113]

Advocates for radical surgery resorted to a number of strategies to shore up confidence in the curability of uterine cancer. The first was to suggest that the word 'cure' had a variety of meanings. The second was to criticize established methods of vaginal hysterectomy. The third was to shift the responsibility for failure on to general practitioners and sufferers themselves, by framing late diagnosis as a problem of 'delay'. Let us examine each of these strategies in greater detail.

Redefining the Meaning of Cure

Surgeons and obstetricians proposed that hysterectomy was associated with several types of 'cure'. German gynaecologist Georg Winter argued that any patient who was free from recurrence for a period of one year should be regarded as 'cured'.[114] Others followed Richard von Volkmann's teaching that a patient was 'permanently' cured if she was free from local recurrence for three years after operation (later extended to five years).

Charles Plumley Childe, the English abdominal surgeon and anti-cancer activist, suggested that distinctions between 'cure' and 'disease-free remission' were purely academic: 'The experience of the last twenty-five years has proved up to the hilt that an ever-increasing proportion of cases of this disease is curable by operation', he wrote in 1906. 'Call it "cure", "freedom from recurrence", "lasting relief", or by any name we please, the fact remains that hundreds of people, proved to have been the victims of cancer, find themselves, as the result of modern operations, in the enjoyment of perfect health for many years.'[115] Echoing these sentiments, the French gynaecologist Samuel Pozzi put a positive spin on disappointing results by declaring that 'a temporary cure is still a cure'.[116] The tendency to equate short-term disease-free survival with cure took firm root right across the entire spectrum of radical cancer surgery. William Halsted, for example, argued in 1895 that breast cancer should be considered 'radically' or 'permanently' cured if three years had passed without evidence of local recurrence.[117] Any cancer occurring outside the three-year period did not count towards the statistics of operation: it was simply regarded as a fresh case.

Not all surgeons agreed. Arthur Marmaduke Sheild, writing in 1896, reminded colleagues that most patients and practitioners understood the word cure to mean 'the removal or banishment of a disease which never returns and leaves the body and mind of the individual in a physical and mental condition equal or closely approximating to the perfection of normal health'.[118] He warned that loose talk of 'cures' could harm confidence in the profession. Sheild's contemporary Edmund Owen, consulting surgeon to St Mary's Hospital in London, thought that surgeons should not massage their results by setting arbitrary time-limits for their cases, and calling them cures.[119] Despite such criticisms, the concept of 'surgical cure' became firmly established as a means of evaluating long-term operative outcomes. As we shall see in Chap. 5, in the 1920s it was also initially adopted as the 'gold standard' against which therapeutic innovations such as X-ray and radium therapy were assessed.

Critiques of Vaginal Hysterectomy

In German-speaking countries, a few surgeons claimed that the results of vaginal hysterectomy were unsatisfactory because the methods in use were not radical enough. German-born Emil Ries, a gynaecologist who trained in Strasbourg before moving to Chicago, blamed poor long-term outcomes on the 'conservative radicalism' of most surgeons. In 1895 he proposed that uterine malignancies advanced along the lymphatics, in a manner analogous to cancer of the breast. Ries insisted that all operations for ‘early’ (operable) cancer of the cervix must extend to the lymphatic vessels and nodes, so as to eliminate the channels of dissemination. He also contended that the uterus and surrounding tissues must be removed in one piece (*en bloc*), to prevent cancer cells from ‘infecting’ the wound. The model for this procedure was the radical mastectomy operation pioneered by William Halsted at the Johns Hopkins Hospital in Baltimore. Halsted advocated the removal of the entire breast, the pectoral muscles and the axillary glands in one piece.[120] Ries was the first to demonstrate, by carrying out a series of experiments on dogs and cadavers, that hysterectomy may be performed on the lines of Halsted’s ‘complete’ mastectomy. The new method required surgical access to the abdomen, partly to facilitate the excision of the upper portion of the broad ligaments, partly to enable the removal of the lymph nodes lying on the iliac vessels. The latter procedure is impossible by the vaginal route.

Quite independently of Ries, more radical abdominal hysterectomies were developed in the mid-1890s by Friedrich Rumpf in Berlin and Wilhelm Latzko in Vienna. The problem with such extensive surgery was that any improvement that might be achieved in remote results was at the cost of increased risk from haemorrhage, injury to the ureters and the establishment of large wounds in the connective tissues. Ries thought that the risk was worth taking. In a paper read at the annual conference of the American Medical Association in 1906, he declared that a severe operation was preferable to a ‘lingering, often horribly painful and disgusting disease, the best side of which is the semi-idiocy of the morphin-numbed bearer of cancer’.[121]

Gynaecologists were divided over Ries’s ‘complete operation’, as hysterectomy with lymphadenectomy was sometimes called. Some doubted that the breast cancer model of metastatic spread was applicable to cervical cancer. Others thought that the potential benefits of the procedure did not offset the risks. Ries’s method thus won only limited support amongst gynaecologists. It found enthusiastic advocates in the United States and in German-speaking countries, but in both England and France most practitioners continued to treat the early cases by the vaginal method, or by simple hysterectomy.

The Notion of ‘Delay’

The third strategy emerged during the mid-1890s. Surgeons in most countries increasingly insisted that uterine cancer’s surgical incurability merely reflected the fact that the disease was usually diagnosed in its most advanced stages: ‘It is little wonder that the laity and even some physicians consider cancer of the cervix of the uterus an incurable disease’, the American surgeon John Sampson declared in 1904, ‘for over three-fifths of the patients … come too late for anything but palliative treatment, and probably over three-quarters of the patients operated on will die from cancer within five years of the operation’.[122] The view that women usually presented too late for successful treatment was by no means new. What was new in the 1890s was the belief that late diagnosis was a problem of ‘delay’. The notion of ‘delay’, as used in a variety of settings, has negative connotations in implying a holding back, usually by interference, from completion or arrival. Use of the word ‘delay’ in a medical context is judgemental and potentially stigmatizing, because of its implications of intent: the linguistic choice conveys the idea that someone, somewhere, is to blame for apparently failing to manage a risk appropriately.

Modern accounts of delayed diagnosis break down the diagnostic pathway into three components: the patient interval; the primary care interval, and the secondary care interval. Early twentieth-century narratives of ‘delay’ narrowed the discussion to the first two components, typically focusing on women’s responses to abnormal symptoms, and on general practitioners’ management of suspicious cases. Leading specialists blamed not only Englishwomen’s proverbial modesty, but also ignorance of ‘early’ symptoms: ‘The reasons why women neglect to apply early for medical relief are many’, gynaecologist Thomas Wilson observed in 1906. ‘Modesty is occasionally suggested, and sometimes the want of the necessary means … But by far the most important reason for delay is the widespread ignorance which prevails about the early symptoms.’[123]

Consultants were also concerned about perceived failings on the part of the GP. An editorial published in the *BMJ* for January 1901 remarked that women were not always culpable for diagnostic delays:

> Unfortunately – and this is the point that concerns us – a different story is sometimes told. The patient notices her symptoms. She has heard of cancer of the womb … and she goes to a doctor. He does not examine her, but tells her that her symptoms are due to the change of life. Perhaps he does

> examine her, but he fails to notice the signs that might have guided him to a correct diagnosis. Later on, the failure of his treatment drives the patient to seek further advice, and then the cancer is discovered, but it is too advanced for cure.[124]

Bearing in mind that gynaecologists regarded the diagnosis of early uterine cancer as highly problematic, these comments may seem a bit unfair. One way of understanding them is in terms of professional tensions between GPs and hospital consultants. Particularly in London, GPs had long complained about what they perceived to be the poaching of patients by consultants. Consultants for their part frequently accused the GP of self-interest for failing to refer patients to consultants sufficiently quickly.[125] In 1910, for example, a physician complained that 'just as the dishonest consultant steals a patient, so a dishonest general practitioner keeps a patient to himself long after he has discovered that he cannot without further advice on diagnosis or treatment do the best for such a patient'.[126] Echoing these sentiments, the *BMJ* ended its tirade against the GP with the warning that

> the practitioner who forgets the possibility of early cancer, or who fails either to educate himself in the recognition of this disease, or to send his patient to someone who is able to recognise it, incurs a very heavy responsibility, one concerning which the public, as years go on, will become more and more exacting.[127]

Concerns with the quality of GP referral and diagnosis also revealed issues around professional authority and expertise, rooted in deep-seated differences of prestige, power, interest, culture and class within the medical profession. Sir James Paget, President of the Royal College of Surgeons, divided the profession into ranks of 'officers and men', thereby recognizing that the distinction between hospital consultants and GPs was a matter of hierarchical differences.[128] Discussions about practitioner delay left the reader in no doubt that the humble GP should defer to expert opinion when dealing with a potentially cancerous case.

Improving Operability

The concern with diagnostic delay did not immediately translate into efforts to educate women and GPs in the recognition of the 'early' symptoms of uterine cancer. Surgical efforts to improve curability were focused at first on extending existing methods of abdominal hysterectomy, to improve rates of operability. The underlying assumption was that operable cases were, by definition, potentially curable. In 1895 John G. Clark, a resident in the gynaecological department of the Johns Hopkins Hospital, reported the details of a 'more radical method' of abdominal hysterectomy, used to treat three patients already written off as inoperable.[129] Clark's procedure was based on the principle of resection *en bloc*, but the details varied according to the case. He removed the uterus and broad ligaments in the first three cases, but in subsequent operations he took out either the lymph nodes, or the parametrium and part of the vagina. The technique was further refined by Clark's chief at Johns Hopkins, the renowned gynaecologist Howard Kelly, who perfected the dissection of the ureters from the region around the growth.

Building on these experiences, in the late 1890s the Austrian gynaecologist Ernst Wertheim began to develop his own extended method of abdominal hysterectomy (Fig. 3.1). A student of the legendary pioneer of abdominal surgery Theodor Billroth, Wertheim trained with the gynaecologist Rudolf Chobrak in Vienna. In 1891 he became first assistant to Friedrich Schauta in Prague. When Schauta was appointed head of the University Hospital of Vienna, Wertheim followed him as his assistant. An intense rivalry developed between Wertheim and Schauta regarding the treatment of cervical cancer: Schauta favoured the vaginal approach, whereas Wertheim advocated the abdominal route.[130] Such was the antagonism between them that Wertheim was only able to develop his own method when he achieved his independence in 1897, as chief surgeon in the Department of Gynaecology at the Bettina Pavilion of the St Elisabeth Hospital. In 1910 he was appointed director of the first University women's clinic in Vienna, where he devoted himself to devising new surgical techniques for the treatment of uterine prolapse. As well as developing innovative surgery, Wertheim conducted important research of gonorrhoea in the female genital tract, and he was the first to demonstrate the presence of gonococcus in the peritoneum.

Wertheim always attached more importance to the removal of the cellular tissue than to the excision of the lymphatics, but he eventually added

Fig. 3.1 John Quincy Adams: Ernst Wertheim performing an abdominal hysterectomy, 1909 (Courtesy of the Image Archive, Collections of the Medical University of Vienna)

the latter as a routine procedure. He also clamped the vagina beneath the cancer to isolate the growth before removal, to eliminate the risk of ‘infecting’ the healthy portion of the vagina with cancer cells. In the second decade of the twentieth century the method gained wide acceptance as ‘Wertheim’s hysterectomy’, and a ‘Wertheim’ became a synonym for any wide abdominal extirpation of the cancerous uterus, without regard to the manner in which it was performed. In a review of the British literature, gynaecologist Comyns Berkeley concluded that the only distinctive feature of the method was the use of clamps on the vagina. Irish gynaecologist E. Hasting Tweedy, writing in 1911, agreed that this was Wertheim's only claim to originality, adding somewhat dismissively that never before had an operation 'become classical on such meagre grounds'.[131]

Speaking at the annual meeting of the BMA, held in Leicester in 1905, Wertheim explained that his original intention had been to help women with advanced, inoperable malignancies – those who were, 'so to speak, shut out from life'.[132] He had subsequently extended the scope of his procedure to all cases of carcinoma of the cervix, in the belief that the extended abdominal operation, being so much more radical than the vaginal method, would also be more effective. Eventually, though, he had reverted to the vaginal operation in cases of cancer of the body of the uterus, and in very early cases of cervical cancer – those that could only be confirmed by microscopic analysis. Wertheim did not define his criteria of operability, but he claimed that his method dramatically increased the operability rate, from 15 per cent (the best that could be achieved by vaginal hysterectomy) to 50 per cent. He also stated that 40 out of every 100 patients operated on were still symptom-free after five years, as compared with the 10 per cent or less obtainable by simple abdominal or vaginal hysterectomy.

During his visit to England in 1905 Wertheim was invited by Cuthbert Lockyer, a well-known London gynaecologist, to demonstrate the operation on one of his (Lockyer's) patients at St Mary's Hospital, Plaistow (East London). A graduate of Charing Cross Medical School, Lockyer had studied in Bonn and in Vienna, where he had learnt the techniques of vaginal hysterectomy.[133] He held various appointments in London, and he was a member of both the Royal College of Surgeons and the Royal College of Physicians. Lockyer was widely regarded as a master of vaginal hysterectomy, but he was interested in Wertheim's procedure because, by his own account, he was disillusioned with the results and limited applicability of the vaginal operation.[134] As a fluent German speaker, he was also undoubtedly more receptive to German innovations than most of his English colleagues (in the 1910s he was one of the first to draw attention to German advances in the field of radiation therapy). There is an interesting account of the operation carried out by Wertheim at St Mary's in a historical review of British obstetrics and gynaecology, published in 1954. Wanting further help during the surgery, Wertheim spotted a young man who was washing his hands in a remote corner of the room. He shouted to him 'Come here!' and without further ado, taking the young man's bare hands, he placed them so as to retract the abdominal wound more thoroughly. The after-history of this case proved a tragedy. The patient lived for barely three days, finally succumbing to peritonitis. It later transpired that Wertheim's helper had been dressing a septic wound, and that he had only come to the theatre to wash away the blood and pus from his fingers.[135] This depressing experience did not deter Lockyer from performing the operation himself, spurred on, as he later confessed, by an 'enthusiastic temerity'.[136] His first three cases were fatal but, like other pioneers of innovative surgery, he persevered with the operation in the belief that the improvement-and-safety approach would eventually produce better results.

Interest in Wertheim's procedure rose in England after the Leicester meeting. At the annual meeting of the BMA two years later, a number of gynaecologists (including one of the women surgeons at Elizabeth Garrett Anderson Hospital in London) spoke about their experience of the method. Lockyer showed twelve specimens removed by operation. He declared his resolve never to use the vaginal route again, claiming that Wertheim's was '*the* operation of the future' for both early and advanced cases.[137] It was after this that Comyns Berkeley, consultant gynaecologist at the Middlesex Hospital, came to him for tips and details of the operation. This was the beginning of the extensive series of Wertheim hysterectomies carried out at the Middlesex by Berkeley and his consultant colleague Victor Bonney. By 1941 Bonney alone had performed 500 operations, with a 'cure-rate' of 40 per cent and an operative mortality of 14 per cent.[138]

Pioneers of the Wertheim method hailed the operation as a breakthrough in cancer therapy, but the great majority of British obstetricians and gynaecologists were more sceptical. What stuck in their throats was the mortality from the surgery: 30 per cent in Wertheim's first series of 100 hysterectomies – subsequently reduced to 20 per cent, but still double the operative mortality from the vaginal operation. Leading practitioners condemned Wertheim's innovation as a cruel and needless operation. William Japp Sinclair thought that the depressing results of vaginal hysterectomy had sparked 'a rush, especially in Germany, to the extreme verge of the practical in dissecting out not only the internal sexual organs but the whole of the lymphatics and cellular tissue of the pelvis'.[139] He had no hesitation in saying that most of these operations were 'homicidal vivisections, which nothing hitherto advanced in their support appears to palliate, much less to justify'.[140] Frederick McCann, obstetric physician to the Samaritan Hospital for Women in London, emphasized in 1907 that 'unless temporary or permanent benefit can be promised to the patient, it is not justifiable to subject her to a prolonged and dangerous operation which cannot completely remove the disease, more especially as the palliative operations and methods of treatment give considerable relief in the advanced stages of the disease and are less dangerous'.[141] Wertheim was also criticized in his own country. According to one of his German detractors, the 'radical' nature of his operations was expressed 'only in the sad immediate and remote results, a high primary mortality and injuries to the ureters and bladder in those who survive for a time' – meaning that it was not beneficial in any way at all.[142]

The Controversy in Context

There are two contexts in which British condemnations of Wertheim may be understood. The first is the late nineteenth-century climate of public and professional concern about the implications of surgical advancement. Accusations of surgical recklessness were rife in the anti-vivisectionist literature of the time, and a significant aspect of this propaganda was the association of leading-edge surgery with the introduction of German experimental methods into Britain. Surgeons themselves were increasingly sounding a note of caution about pioneering operations and, as Sinclair's words suggest, this caution was rooted, at least in part, in fears about the importation of a peculiarly German scientific morality.[143]

The other context was the long-standing professional debate about the performance of abdominal operations by obstetric physicians. This dispute, which had begun in the late 1870s with the establishment of ovariotomy, was entering a critical phase in the early 1900s. Much to the discomfort of the obstetrical profession, general surgeons who specialized in women's diseases were beginning to claim autonomous status for gynaecology as a specialty based on innovative surgical procedures. The leader of this movement was Victor Bonney. The distinguished gynaecologist spoke with contempt of the 'inert, inept "men-midwives"' who had previously 'treated' women's ailments. In a retrospective appreciation of Wertheim's hysterectomy, published in 1949, he portrayed critics as a bunch of old fogeys, saying that 'the older British gynaecologists of that time … had not undergone that training in general surgery which renders the mind receptive to and capable of exploiting new ideas'.[144] Bonney regarded himself as a general surgeon who specialized in the pelvis. He wanted all gynaecologists to train as surgeons, and in the 1920s he led a campaign to establish gynaecological surgery and operative obstetrics as a specialty within the Royal College of Surgeons (RCS).[145]

Practitioners who combined gynaecology with obstetrics strenuously resisted the idea that the two fields should be divorced. As I have shown elsewhere, they eventually won the day, achieving unification in 1929 with the establishment of the British (later Royal) College of Obstetricians and Gynaecologists (RCOG).[146] One of the arguments in support of the merger was that obstetricians had special knowledge of the physiology and pathology of the female reproductive system. This holistic understanding was also said to give a more 'conservative' orientation to the surgical practice of the obstetrician. The implication was that female patients would receive more appropriate treatment from the specialist who had a complete understanding of femininity and reproduction, than from the abdominal surgeon who lacked the obstetrical point of view. In his history of the RCOG, published in 1954, Manchester obstetrician William Fletcher Shaw claimed that Bonney's proposals would have caused much harm if successful, since women with gynaecological ailments would have become dependent for treatment 'upon men trained as abdominal surgeons and with a bias towards operative rather than non-operative treatment'.[147] Professional opposition to Wertheim can thus be seen as one of the ways in which early twentieth-century obstetricians/gynaecologists constructed a distinctive occupational identity as the guardians of woman's health. This served to advance a broader professional agenda, aimed at rebuffing aggressive surgical attempts to shape the development of gynaecology as a specialty.

A Message of Hope

Wertheim's critics suggested that the operability of uterine cancer should be increased by reducing delay in treatment rather than by extending the reach of surgery. As Sinclair emphasized in 1902, practitioners should rely 'not on the extension of operative procedures into the brilliance of vivisections, but on the united efforts of all concerned to bring the cases under surgical treatment at the earliest possible stage'[148] Obstetric physicians proposed that early diagnosis of uterine cancer would enable sufferers to undergo a vaginal hysterectomy. They argued that the procedure was less dangerous than abdominal hysterectomy, and just as effective in the early cases.

It should not be assumed that Wertheim and other pioneering gynaecologists were unconcerned about treatment delay. The main reason was that, by 1905, most surgeons admitted that even the ‘complete’ operation had failed to deliver on its promise. At a meeting of the Johns Hopkins Medical Society, held in February 1905, John Sampson acknowledged that very little was being achieved by way of surgical cure: 75 per cent of the cases admitted to his clinic were inoperable, recurrences took place in three-quarters of the patients operated on, and in 93 per cent of all cases there was simply no cure.[149] John Clark, himself a pioneer of the complete operation, pinned his hopes on early diagnosis: ‘From the operative standpoint the outlook was not bright’, he reportedly said. ‘It was absolutely necessary to have the diagnosis made early, when the cases could be saved by surgery.’ As to the future, ‘something might be hoped for from the work being done to develop treatment other than surgical’.[150]

Leading gynaecologists endorsed early treatment also because they thought that complex surgery was well beyond the ability of the average obstetrician/gynaecologist: ‘The operation has its sad limitations’, Ernst Wertheim declared in 1905; ‘it requires great skill and experience, and many surgeons cannot have this experience, and many never acquire just the particular skill demanded, and this means a great loss of life, which offsets the good results in the hands of a few men’.[151] In order to make surgery available to the largest number of sufferers, it was essential that uterine cancer should be transformed into a condition manageable by the large majority of surgeons: the best hopes thus lay ‘in the dissemination of knowledge touching the early symptoms of cancer, so that women shall apply at once when they note an atypical bleeding or discharge, and the profession will give more prompt and earnest attention to these symptoms’.[152]

A consensus thus emerged around the necessity for early diagnosis. The new hope was that early treatment (whether by vaginal or by abdominal hysterectomy) would produce more cures. In 1902 London obstetrician Arthur Lewers sounded an upbeat note: ‘that cancer of the uterus is a hopeless and uniformly fatal disease is a proposition that has been true in the past through the whole period of human history during which the disease has been known’, he observed.

> But the position is now entirely altered, since we now know that, if only cases are recognised in an early stage, a fair proportion may be permanently relieved by operation … Hence it may be hoped that in the future suspicious

> symptoms will lead to prompt and thorough investigation, since at all events a diagnosis of cancer of the uterus in an early stage is now by no means equivalent to the diagnosis of a fatal disease.[153]

In reality no one knew whether an early operation was in any way likely to bring about the hoped-for cure. But as surgery had reached its limit with the development of the Wertheim method, a change of direction was in order. From now on, the task for gynaecologists and surgeons would be to persuade women to consult early and agree to submit to a dangerous, painful and mutilating operation with uncertain benefits.

Notes

1. Timmermann, *A History of Lung Cancer*.
2. West, *Lectures*, p. 342.
3. Castri, 'Du traitement palliatif du cancer du col ulcéré de l'utérus', p. 6.
4. Murphy 'From Friedenheim to Hospice', esp. pp. 221–3.
5. Hodgkinson, *Origins of the National Health Service*, pp. 543–4.
6. Marsden, *On a New and Successful Mode of Treating Certain Forms of Cancer*, pp. 14–15.
7. Lewis, *Medicine and Care of the Dying*; Moulin, 'Les soins palliatifs en France'; Healy, *125 Years of Caring in Dublin*; Broome, 'Neither Curable nor Incurable'; Humphreys, 'Undying Spirits'.
8. Szabo, *Incurable and Intolerable*.
9. Copland, 'Cancer', pp. 283–4; Carswell, 'Scirrhous'.
10. Walshe, *The Nature and Treatment of Cancer*, p. 224.
11. Wells, *Cancer Cures and Cancer Curers*, pp. 30–1.
12. Ries, 'The Diagnosis of Operability', p. 91.
13. Téallier, *Traité du cancer de la matrice*, p. 187. See also Simpson, 'Carcinoma of the Uterus', p. 490.
14. Moore, 'Clinical Studies of Cancer. I', p. 137.
15. See e.g. Rigby, *On the Constitutional Treatment of Female Diseases*, p. 203; Edis, *Diseases of Women*, p. 222.
16. Barnes, *A Clinical History of the Medical and Surgical Diseases of Women*, p. 834.
17. Barbour and Watson, *Gynecological Diagnosis and Pathology*, p. 3.
18. Hewitt, *The Diagnosis, Pathology and Treatment of Diseases of Women*, p. 218. See also West, *Lectures*, p. 32. On the importance

of the ‘educated touch’ in gynaecology, see Yeniyurt, ‘When it Hurts to Look’.

19. Playfair, ‘Obstetrical Society of London: Extirpation of the Entire Uterus’, p. 42.
20. Rigby, *On the Constitutional Treatment of Female Diseases*, p. 214.
21. Hewitt, *Diagnosis*, pp. 572–3.
22. Velpeau, *A Treatise on Cancer of the Breast*, pp. 67–8.
23. Rosen, ‘Beginnings of Surgical Biopsy’, pp. 361–4. On French medical microscopy see La Berge, ‘Medical Microscopy in Paris, 1830–1855’.
24. Velpeau, *A Treatise on Cancer of the Breast*, pp. 67–87.
25. La Berge, ‘Dichotomy or Integration?’
26. Winter and Ruge, *Lehrbuch der Gynäkologischen Pathologik*, pp. 41–3.
27. Wright Jr., ‘The Development of Frozen Section Technique’; Löwy, ‘Breast Cancer’.
28. See e.g. Tait, *Diseases of Women and Abdominal Surgery*, pp. 116–17.
29. See e.g. Sinclair, ‘Malignant Growths of the Uterus’, pp. 344–5.
30. Wright, ‘The 1917 New York Biopsy Controversy’.
31. See e.g. Bainbridge, ‘Biopsy and Cancer’.
32. Löwy, ‘Breast Cancer’, p. 254. See also Aronowitz, *Unnatural History*, pp. 102–4.
33. Greenough, ‘The Handling of Early or Doubtful Cases’, p. 389.
34. Wright Jr., ‘The Development of Frozen Section’; Gal, ‘In Search of the Origins of Modern Surgical Pathology’; Lechago, ‘The Frozen Section: Pathology in the Trenches’. On the use of the frozen section in Glasgow, see Jacyna, ‘The Laboratory and the Clinic’.
35. Löwy, ‘“Because of their Praiseworthy Modesty”’.
36. The term ‘radical cure’ was also used to describe operations aimed at eliminating hernias and ovarian cysts; see e.g. Haller, ‘On the Radical Cure of Inguinal Hernia’; Moscucci, *Science of Woman*, pp. 135–40.
37. Ramsbotham, ‘Lectures on the Morbid Affections of the Puerperal and Pregnant States’, p. 470.
38. See e.g. Southam, ‘The Nature and Treatment of Cancer’, p. 31.
39. Ricci, *The Development of Gynecological Surgery and Instruments*, p. 388.

40. Carol, ‘Une sanglante audace’.
41. See e.g. ‘Hospital reports: Hospice de Perfectionnement’.
42. Pauly, *Maladies de l’utérus.*
43. Quoted in Carol, ‘Une sanglante audace’, p. 193; translation mine.
44. The first recorded case in Britain dates back to 1827. The patient, a woman who suffered from a condition suspected to be of a ‘carcinomatous character’, survived the operation, but there is no account of her subsequent progress; Lewis, ‘Extirpation of the Neck of the Uterus’.
45. ‘Review of *Diseases of the Uterus*’, p. 533.
46. Churchill, *On the Diseases of Women*, p. 326.
47. Simpson, ‘Case of Amputation of the Neck of the Womb Followed by Pregnancy’.
48. Simpson, ‘Carcinoma of the Uterus’, p. 491.
49. Simpson was later to use the method to calculate the risks and benefits of anaesthesia; Burney, ‘Anaesthesia and the Evaluation of Surgical Risk’.
50. ‘Clinique chirurgicale de l’Hôpital de la Pitié par J. Lisfranc T. 3’, p. 456.
51. West, *Lectures*, p. 395. See also Smith, *The Principles and Practice of Surgery*, vol. 2, p. 577.
52. Blundell, ‘Extirpation of the Uterus’.
53. See e.g. Ramsbotham, ‘Lectures on the Morbid Affections of the Puerperal and Pregnant State’, p. 474; Ashwell, *Practical Treatise*, p. 422.
54. Simpson, ‘Cauliflower Excrescence of the Uterus’.
55. Parker, *The Treatment of Cancerous Diseases by Caustics.*
56. For a contemporary account, see Wells, *Cancer Cures.*
57. See e.g. Ashwell, *Practical Treatise*, pp. 387–93; Walshe, *The Nature and Treatment of Cancer*, pp. 193–203. ‘Constitutional’ treatment was recommended for most forms of cancer, whether surgery was undertaken or not; see e.g. Southam, ‘Nature and Treatment of Cancer’, p. 31. The practice of leeching was inspired by Broussais, who taught that inflammation was both cause and consequence of cancer.
58. Snow, *Operations without Pain*, pp. 150–1.
59. Spence, ‘An Address in Surgery’, p. 193.
60. For a contemporary account, see O’Doherty, *Observations on the Practice of Ecrasement Linéaire.*

61. Ricci, *Development of Gynecological Surgery*, pp. 527–8.
62. Nicholson, 'Cancerous Uterine Tumour'.
63. 'Use of the *Ecraseur* of Chassaignac by Mr. Stanley in a Case of Chimney-Sweeps' Cancer'.
64. Ibid.
65. 'The Week'.
66. Desmond, 'Liverpool Northern Dispensary'.
67. West, *Lectures*, 4th ed., pp. 416–17. See also Hart and Barbour, *Manual of Gynecology*, pp. 456–7.
68. On the use of the galvano-cautery, see Simpson, *Clinical Lectures on Diseases of Women*, p. 70; Simpson, 'On the Removal of Portions of the Diseased Tissues'; Hart and Barbour, *Manual of Gynecology*, p. 457.
69. Huguier, *Mémoire sur les allongements hypertrophiques du col de l'utérus.*
70. Barnes, *Clinical History*, p. 811.
71. 'Virchow on Cancer'.
72. Sibley, 'A Contribution to the Statistics of Cancer', pp. 126–7.
73. Moore, 'Cancer', pp. 557–60. Moore was less optimistic about the curative potential of ablation.
74. Barnes, *Clinical History*, pp. 839–40.
75. Simpson, *Clinical Lectures*, p. 73.
76. Tröhler, 'Surgery (Modern)', pp. 993–6.
77. Schroeder, *Handbuch der Krankheiten der weiblichen Geschlechts organe*, pp. 300–1. The method was first described by Schroeder in vol. 3 of the *Zeitschrift für Geburtshilfe und Gynäkologie*, the journal of the Society of Obstetrics and Gynaecology founded in Berlin in 1876.
78. Freund, 'Eine Neue Methode der Exstirpation des Ganzen Uterus'.
79. Ibid.
80. For details of the method, see 'Extirpation of the Whole Uterus'. See also Longo, 'Classic Pages in Obstetrics and Gynecology'.
81. A subtotal hysterectomy involves removing the main body of the womb and leaving the cervix in place.
82. Clay, 'Observations on Ovariotomy, Statistical and Practical'.
83. Greenlees, 'For the Convenience and Comfort of the Persons Employed by Them'. Kimball became in 1882 the eighth president of the American Gynecological Society, founded in 1876.

84. Madden, 'On the Treatment of Uterine Fibro-Myomata'. See also Madden, 'Some Points on the Treatment of Uterine Fibromyomata'.
85. Moscucci, *The Science of Woman*, pp. 166–70.
86. Keith, 'On the Treatment of Uterine Tumours by Electricity', p. 1284.
87. 'Extirpation of the Cancerous Uterus'.
88. Ibid., p. 836; Polk, 'The Indications for Hysterectomy'. See also 'Society Proceedings: Minutes of the Eighth Annual Meeting of the American Gynecological Society', p. 372.
89. Coe, 'Present Status', p. 487.
90. 'Extirpation of the Cancerous Uterus', p. 836.
91. For another example of this strategy, see Schlich, 'Risk Assessment and Medical Authority in Operative Fracture Care'.
92. Wallace, 'Total or Partial Extirpation of the Uterus for Malignant Disease', p. 520.
93. 'Obstetrical Society of London: Extirpation of the Entire Uterus [Adjourned Discussion on Dr Duncan's paper]', p. 96.
94. 'Extirpation of the Cancerous Uterus', p. 837.
95. Quoted in Coe, 'Present Status', p. 491.
96. Rogers, 'The Vaginal Extirpation of Carcinoma of the Uterus', p. 522.
97. Schroeder, 'The Vaginal Extirpation of Carcinoma of the Uterus', p. 522.
98. Ibid.
99. K. Thornton, commenting on Schroeder's paper.
100. Jackson, 'Vaginal Hysterectomy for Cancer'. See also Coe, 'Present Status', esp. pp. 490–1.
101. Jackson, 'Vaginal Hysterectomy', p. 170.
102. Tait, *Diseases of Women and Abdominal Surgery*, p. 117.
103. Edis, 'Summary of Gynaecology', p. 98.
104. Tröhler, 'To Assess and to Improve'.
105. Martin, 'A Plea for Early Vaginal Hysterectomy', p. 157.
106. Montgomery, 'Vaginal Hysterectomy', p. 148. See also Boldt, 'Malignant Neoplasms of the Uterus', pp. 605–6.
107. Jessett, 'Address on the Results of the Operations of Vaginal Hysterectomy'. See also Senn, 'On Some of the Limits', p. 914.
108. Ries, 'The Operative Treatment of Cancer of the Cervix Uteri', p. 1869.

109. For a detailed description of different methods, see Grimoud, *La lutte contre le cancer de l'utérus*, pp. 113–22.
110. Pozzi, *Traité de gynécologie clinique et opératoire*, vol. 1, p. 444.
111. Grimoud, *La lutte contre le cancer de l'utérus*, p. 246.
112. 'Society Proceedings: The Treatment of Cancer of the Uterus', p. 1470.
113. Snow, 'The Causation of Cancer'.
114. Grimoud, *La lutte contre le cancer de l'utérus*, p. 200.
115. Childe, *The Control of a Scourge*, p. 2.
116. Pozzi, *Traité de gynécologie*, p. 444.
117. Halsted, 'The Results of Operation for the Cure of Cancer of the Breast', p. 8. See also Cheyne, 'The Objects and Limits of Operations for Cancer'. Cheyne argued, however, that metastatic disease should also be taken into account.
118. Sheild, 'The "Cure" of Cancer by Operation', p. 801.
119. Owen, 'The Bradshaw Lecture on Cancer', p. 1684.
120. Lerner, *Breast Cancer Wars*, pp. 17–27; Aronowitz, *Unnatural History*, pp. 88–93.
121. Ries, 'Operative Treatment of Cancer of the Cervix Uteri', p. 1871.
122. Sampson, 'The Invasion of Carcinoma of Cervicis Uteri into the Surrounding Tissues', p. 1271.
123. Wilson, 'Address on the Necessity for Immediate Diagnosis', on p. 546. See also 'Early Recognition of Uterine Cancer'.
124. 'Early Recognition of Uterine Cancer', p. 164.
125. Digby, *The Evolution of British General Practice*, pp. 290–1; Peterson, *The Medical Profession*, pp. 227–31.
126. Quoted in Digby, *The Evolution of British General Practice*, pp. 34–5.
127. 'Early Recognition of Uterine Cancer', on p. 165.
128. Peterson, *The Medical Profession*, pp. 230–1.
129. Clark, 'A More Radical Method of Performing Hysterectomy'.
130. Powell and Gonzales, 'Powell's Pearls: Friedrich Schauta, MD (1849–1919)'.
131. Tweedy, 'Method of Radical Extirpation of the Cancerous Uterus', p. 351.
132. 'Section of Obstetrics and Gynaecology: Diagnosis and Treatment of Cancer of the Uterus', p. 691.
133. Peel, *Lives of the Fellows*, pp. 241–3.
134. Lockyer, 'Operative Treatment of Carcinoma of the Cervix'.

135. ‘The Rise of Surgical Gynaecology 1800–1950’, p. 365.
136. Lockyer, ‘Operative Treatment of Carcinoma of the Cervix’, p. 444.
137. Ibid.
138. Bonney, ‘The Results of 500 Consecutive Cases of Wertheim’s Operation’.
139. Sinclair, ‘Carcinoma in Women’, p. 325.
140. Ibid.
141. McCann, *Cancer of the Womb*, p. 89.
142. Quoted in Sinclair, ‘Malignant Growths’, p. 351.
143. Boddice, ‘German Methods, English Morals’.
144. Bonney, ‘Wertheim’s Operation in Retrospect’, p. 637.
145. Moscucci, *The Science of Woman*, pp. 182–3.
146. Ibid., pp. 186–206.
147. Shaw, *Twenty-Five Years*, p. 11.
148. Sinclair, ‘Carcinoma in Women’, on p. 326.
149. ‘The Johns Hopkins Medical Society: The Cure of Uterine Cancer’, p. 188.
150. Ibid. Clark may have been referring to X-ray therapy.
151. ‘Section of Obstetrics and Gynaecology: Diagnosis and Treatment of Cancer of the Uterus’, p. 695.
152. Ibid.
153. Lewers, *Cancer of the Uterus*, p. 1.

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CHAPTER 4

Gender and Cancer Awareness Campaigns in England, c.1900–1948

The professional dispute over Wertheim's hysterectomy came to a head at a time when cancer was beginning to gain new social significance as the greatest scourge of humankind. Rising rates of mortality and the possibility that the disease might be spread by a microbe fanned fears that a new public health crisis was looming. In 1899 Roswell Park, the American surgeon and founder of the eponymous cancer research laboratory, made the startling prophecy that if the increase in cancer mortality were to continue at the same rate, by 1909 there would be more deaths in New York State from cancer than from consumption, smallpox and typhoid fever combined. Western society, he claimed, was doomed to live before long 'under the Sign of Cancer'.[1] The prevailing view in Britain was hardly more optimistic, despite actuarial attempts to prove that the *incidence* of cancer had not increased since the mid nineteenth century. In 1901 the *BMJ* summed up the situation with these words:

> Cancer is still one of the blackest – may we not say the blackest? – spot [*sic*] in the whole field of medicine. It is common, and there is good reason for thinking that it is becoming commoner. It cuts short many lives, and does so by an illness involving great suffering … We have no knowledge of the cause of cancer, and therefore we can do nothing to prevent it.[2]

Yet there was some hope amidst the gloom. According to the journal, uterine cancer was 'one part of this black patch which, by comparison with the rest, might be said to be grey'.[3] If the surgeon could get hold of

O. Moscucci, *Gender and Cancer in England, 1860–1948*,
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it before it had advanced beyond the uterus, he or she could, 'by removing this organ – one which, at the age when cancer is commonest, no longer fulfils any useful function – remove the disease, and cure the patient'.[4]

It was on this premise that in the early 1900s gynaecologists and obstetricians in several Western countries joined forces to call for a 'crusade' against uterine cancer. The aim was to promote the early detection and treatment of the disease by spreading knowledge about its symptoms; getting patients to see their doctor as soon as the disease or its possibility was identified, and ensuring treatment by qualified medical practitioners. The first British campaign was launched in 1907 under the aegis of the BMA. As public health practitioners joined the fight, the focus of the campaign broadened to include other malignancies that were not gender-specific: breast, oral and skin cancer. Yet educational campaigns in Britain continued to direct most attention at women, thus creating the impression that men were not at risk from cancer. This chapter suggests a number of reasons for this asymmetry: assumptions about the potential curability of women's cancers; broader concerns about maternal health; and the view that women as a population could be 'captured' more easily through the services established for maternity. Awareness campaigns were gendered also in the sense that women were seen to have an important part to play in the detection of cancer through their various roles as midwives, nurses and health visitors.

Historians familiar with cancer awareness campaigns in the United States have noted that, by comparison, anti-cancer campaigns in Britain were low-key, half-hearted affairs.[5] British clinicians, researchers, public health workers and government officials rejected national programmes of education, media blitzes and big-screen films to get the early detection message across. Campaigns tended to target health professionals rather than the general public; when they included laypeople, they were usually small, local affairs. I argue in this chapter that this approach was shaped not only by concerns about the demand and supply sides of services, but also by tensions between different aspects of cancer control, and fears about the 'Americanization' of British society. My account also reveals widespread doubts about the efficacy of policies based on 'early detection and treatment'. Against this background, cancer educators attempted to produce a discourse that would not undermine people's faith in medical science, and which would encourage people to consult the doctor without putting excessive pressure on services – a complex balancing act.

The Crusade Agaist Cancer of the Uterus

A movement for the early diagnosis of uterine cancer began to gather momentum in Europe during the early 1900s.[6] The first and most widely cited educational initiative was the campaign launched in 1902 by Georg Winter, the German gynaecologist. Winter was Professor of Gynaecology at the University of Königsberg, which was at the time the capital of the German province of East Prussia (now part of Russia). Earlier in his career, Winter had drawn attention to the number of inoperable cancers that presented in gynaecological departments, blaming delays in diagnosis on women's 'indolence and indifference'.[7] In December 1902 he launched a campaign in East Prussia to encourage early detection, sending a brochure to each doctor, and a leaflet to each midwife practising in the area. He also published an article in the local press entitled 'Warning to Women', which described the early signs of the disease and urged women to consult the doctor at once if they noticed any symptom that might suggest cancer.[8] In 1903 Winter was pleased to report that the campaign had been a success. There were encouraging signs that medical practitioners, midwives and the lay public had responded positively to the appeal. The result was a marked improvement in the operability of the cases, from 62 per cent in 1902, to 74 per cent a year later.

Medical efforts to improve the operability of uterine cancer were stimulated not only by anxieties about the development of risky surgery, but also by new concerns about maternal and child health. Hospital statistics showed that uterine cancer disproportionately affected older, multiparous women. This was especially concerning at a time when the relation between good motherhood and the rearing of healthy future citizens (and soldiers and workers) was emphasized. American gynaecologist John Sampson observed in 1905 that, of the 412 patients diagnosed with cervical cancer at the Johns Hopkins Hospital's gynaecological department, 94 per cent were aged between 30 and 50: 'When … one considers that nearly all of these cases have borne children', he said, 'we must realize that those are afflicted by cancer of the cervix who are most important for the welfare of the home, and at a time when they can least be spared'.[9]A leaflet published in 1906 by the Obstetrical and Gynaecological Society of Roman Switzerland, for distribution among laypeople, urged women to consult the doctor immediately if they noticed any suspicious symptoms: 'Nothing is further from our mind than the idea of creating unnecessary alarm; but when we see the negligence and procrastination which has so frequently led to loss of life of mothers, it is our duty to raise a red alert.'[10]

Proposals for a scheme of instruction were first made in Britain in 1902 by Arthur Lewers, obstetric physician to the London Hospital, in a preliminary note to his book *Cancer of the Uterus*.[11] Lewers believed that all women should be acquainted with the symptoms of uterine cancer, but he thought that 'many difficulties' stood in the way. He did not elaborate what these difficulties might be, but he evidently thought that they would not arise with regard to his chosen target groups: medical practitioners and hospital matrons. He envisaged that copies of an expertly drafted leaflet would be sent to all registered practitioners and hospital matrons, with a request to distribute the material to nurses, midwives and district visitors. Lewers realized that the scheme would be of direct benefit only to women in the health professions, but he thought that it would also help indirectly any woman who came in contact with them.

The first attempt to reach a wider audience was made in 1904 by pathologist Albert S. Grünbaum (later Layton), the director of the Liverpool Cancer Research Fund. It took the form of a letter published in all the major British newspapers, which urged patients to consult the doctor as soon as they noticed 'anything wrong'.[12] The message was intended for both sexes, but it drew special attention to the danger of both breast and uterine cancer. This modest effort may have been aimed at publicizing the work of the Fund as well as the cause of early detection; as far as is known, it was not repeated.

A few practitioners insisted on the necessity for a sustained public campaign. In 1904 Arthur Mayo-Robson, Vice-President of the Royal College of Surgeons, urged collective action to encourage early diagnosis: 'It seems to me most desirable', he said in the prestigious Bradshaw Lecture,

> that some crusade against the neglect of the well-known early symptoms of uterine cancer should be undertaken, and that women should be warned how important it is is for them to consult their medical attendants at an early stage, when, in case of doubt, a small piece of tissue can easily be removed and examined microscopically.[13]

This use of the term 'crusade' to denote a public campaign against a single disease or health issue derives from late nineteenth-century reinterpretations of the crusading phenomenon as a democratic movement, rooted in popular sentiment.[14] Modern health crusades mobilize public support to strengthen the nation, both by encouraging grassroots participation, and by promoting personal responsibility for maintaining good health.[15] The model health crusade in the early 1900s was the international campaign against tuberculosis (TB). The TB movement pioneered many contemporary methods of public health, including the voluntary association devoted to a specific disease, partnerships between physicians and laity, and campaigns of mass public education. In contrast to the campaign against TB, however, calls for a national 'crusade' against cancer met with strong resistance in Britain. In order to understand why, we need to look in some detail at the status of TB, and how it differed from that of cancer.

Tuberculosis and Cancer Compared

The British campaign against TB was instigated in 1898 by Malcolm Morris, the distinguished dermatologist and public health activist. Writing as the editor of *The Practitioner*, a journal established in 1868 to further the scientific study of therapeutics, Morris invoked the notion of holy war, urging readers to start a 'national crusade against a national disease'.[16] The campaign culminated in December 1898 with the establishment of a National Association for the Prevention of Consumption and Other Forms of Tuberculosis (NAPC), under the auspices of the Prince of Wales (later King Edward VII).[17] The Prince's Physician-in Ordinary, William Broadbent (later Sir William), was elected President, and Malcolm Morris agreed to serve as Honorary Treasurer. The association's philosophy had been spelled out by Broadbent in an address delivered at the Huddersfield Technical College in October 1898: 'If consumption is preventable, it ought to be prevented – if it is curable, it ought to be cured.'[18] In order to fulfil this mission, the NAPC targeted three areas: public education; the control of dairies and meat supplies; and the provision of sanatoria, especially for the working class.

Leading English physicians and surgeons did not believe that the campaign against TB was a good model for the fight against cancer, however. The reasons were explained by Morris himself in a special 'cancer issue' of *The Practitioner*, published in April 1899. In the introductory article Morris made it clear that the aim of the journal was not to start 'a movement for the suppression of cancer', such as had been initiated with 'good prospect of success' in regard to TB. A crusade against cancer could not be justified on scientific grounds:

> The movement for the prevention of tuberculosis finds its justification in the reasonable hope there is of success, and this hope lies in the fact that the cause of the disease is positively known, and the means of counteracting its operations are in our hands. The case is altogether different as regards cancer. Its cause is still hidden, or at least too uncertain to be treated, in the practical sphere, otherwise than as an unknown quantity.[19]

It was thus simply foolish to propose a ‘crusade’ against cancer: ‘In the present state of our knowledge’, Morris insisted,

> the efforts of an association for the prevention of cancer would be as purposeless and as futile as the wanderings of Don Quixote in search of chivalrous adventure. And we should be as poorly equipped for such a campaign as the knight of La Mancha with his plasterboard helmet and his bareboned charger.[20]

Morris’s position reflected the view that only the prevention of causes (what we would now call ‘primary’ prevention) counted as ‘true’ prevention. The ‘cause of cancer’ was the factor without which the disease could not develop. As this factor had not yet been identified, there was no point in organizing preventive programmes against the disease. The campaign against TB, on the other hand, was justified by the belief that its causes were known. In the late 1800s the causal model of TB endorsed by NAPC activists was based on the metaphor of ‘seed and soil’.[21] The seed was the tubercle bacillus discovered by Robert Koch in 1882. The bacillus was spread by contagion from infected to healthy bodies. It was a necessary condition for the production of TB, but it was not in itself sufficient to produce the disease: the human condition of the ‘soil’ was also important. People weakened by bad food, bad air and ‘bad drink’ (i.e. alcohol) were deemed to be more likely to acquire an ‘openness’ to infection. NAPC propaganda thus taught that TB was preventable in two main ways: by avoiding the tubercle bacillus (for example, by destroying sputum and washing food utensils), and by adopting a healthy lifestyle.

According to Morris, the challenge posed by cancer required a different kind of approach: a sustained effort to acquire more perfect knowledge of its nature and causation, not only through the provision of dedicated research facilities, but also through the establishment of extensive research networks across the globe.[22] This view, which was supported in Britain by an authoritative body of medical opinion, was to exert a major influence on the direction of British cancer control policy over the next several decades. Apart from the short-lived Cancer Society, an organization founded by Herbert Snow in 1899 to promote both research and education, most early efforts against cancer in Britain were aimed at establishing facilities for research into its causes: the Middlesex Hospital Cancer Research Laboratories (1900); the Imperial Cancer Research Fund (ICRF) and the London Cancer Hospital research laboratory (1902); the Liverpool Cancer Institution and Manchester University Cancer Research Laboratories (1903); and the Glasgow Cancer Hospital Research Department (1910).[23] As the list indicates, most research laboratories were set up as adjuncts to cancer hospitals or departments. The exception was the ICRF, which was Britain's first independent cancer research institute.The development of cancer research facilities was not, of course, a peculiarly British phenomenon: during the early 1900s research programmes combining statistical, geographical and ethnographic inquiries with extensive laboratory investigations in bacteriology, embryology, immunology and cell metabolism were also established in other Western countries. In Britain, though, there was a tendency to privilege research into the causation of cancer over other methods of control: as Alfred Pearce Gould, senior surgeon to the Middlesex Hospital, stated in the 1910 Bradshaw Lecture, 'when the biologist shall know the laws that govern cell-growth, with a knowledge akin in its sweep and accuracy to that of the astronomer, he will have the power to prevent, to control, and to cure, cancer'.[24]

Preventing Mortality

Not everyone agreed that the war on cancer should be waged in the laboratory, however. Critics argued that no one knew how long it might take to discover the cause of cancer. Furthermore, there was no guarantee that a cure would be found even if the cause were known. Writing in 1906, surgeon and anti-cancer activist Charles Childe warned that 'it does not follow that if the cause were discovered to-morrow, there would come with it any treatment but early diagnosis and early and complete removal, the treatment we have at our disposal to-day'.[25] Childe and other like-minded surgeons and physicians did agree that the investigation of the nature and origins of cancer was important, but they claimed that many lives might be saved in the meantime by disseminating the doctrine of early diagnosis and treatment: 'since the causation of malignancy is unknown', the journal *Medical Officer* reiterated in 1922, 'our preventive work must be done on empirical lines; and the very best preventive measure that can be employed at present is that secured by propaganda. The people need to be informed of the signs and symptoms of early cancers, so that they may secure treatment at the earliest possible moment.'[26] It may not have been possible to prevent causes, but an effort could be made to develop policies aimed at discovering and controlling existing or potential disease early – what we would now call 'secondary prevention'.

The most vocal advocate of lay education in England was the abdominal surgeon and public health activist Charles Plumley Childe. In his 1906 book *The Control of a Scourge, or How Cancer is Curable*, Childe used strong language to arouse the public and the profession to the threat posed by the cancer 'foe': according to Childe, the 'deadly monster' had been allowed to 'stalk unchallenged through the land' and 'lay a fatal grip on his all-unconscious victims'.[27] Childe proposed to start a crusade against the enemy, arguing that the war on cancer could not be won without the assistance of the public.[28] While agreeing that the cause of cancer was unknown and that its scientific cure or prevention was not within the scope of 'practical politics', Childe claimed that a cure of cancer was already in sight.[29] People needed to appreciate that 'while we are groping about for a cure of cancer, one is dimly outlined to us, though it will require a herculean effort to make it a practical reality'.[30] The task was to persuade both the profession and the lay public that cancer was 'curable' if treated by early operation. Childe focused on cancer of the skin, mouth, breast, cervix and rectum, in the belief that the more 'accessible' cancers were potentially more curable.[31] He took it for granted that women's cancers would be the primary target of any educational campaign, as both cancer of the breast and cancer of the cervix were in regions that were accessible to surgery.

METHODS AND STRATEGIES

The question was how best to disseminate the early detection message. In 1906 a survey of educational campaigns in various countries, published in Britain's main obstetrical and gynaecological journal, revealed much disagreement about methods and strategies.[32] Most controversial of all was the idea that laypeople should be taught about cancer symptoms. Some commentators argued that what people knew about cancer should be the 'unconscious result' of the knowledge acquired by the profession, rather than the outcome of a deliberate public campaign. Others thought that public education, though undesirable, was necessary in the light of rising mortality rates from cancer.[33] Why was lay education so problematic? Three main areas of concern can be identified. First, like other health advice, lay education could be used as a form of veiled advertising by medical practitioners. Leading medical societies strongly disapproved of doctors who sought to increase their professional visibility by writing advice books and pamphlets for lay audiences. Second, doctors feared that public education would undermine professional authority by facilitating lay knowledge. As the *Lancet* observed in 1905: 'A half-educated but wholly frightened public might try to force the hands of the general practitioner in junctures when the general practitioner would particularly require to be unembarrassed that he might face a difficult situation in a calm and unprejudiced manner.'[34] This quotation hints at the third reason why lay cancer education was such a thorny issue: the danger that it might foster 'cancerphobia'. Many practitioners thought that teaching the public about cancer symptoms would induce an irrational fear of the disease, thus overwhelming any rational response to the educational message.

The main problem for those who did advocate lay education was how to reach the lower classes. Winter believed that mass education was only possible through the newspapers. Childe, on the other hand, thought that press campaigns were not an efficient means of spreading health advice, as any information conveyed through the press was likely to be soon forgotten, unless it was continually repeated. He thus proposed the establishment of a 'more durable machinery', based on the use of the 'intelligent and educated classes' as a vehicle for the educational propaganda: 'We must begin at the top', he wrote. 'Education must of necessity filter downwards, from the stratum above to the stratum below, from the better-informed members of the community to the more ignorant and less intelligent.'[35] The list of potential educators included nurses, midwives, health visitors, clergymen, clergymen's wives, and such like. In order to draw these individuals into the alliance against cancer, Childe proposed to set up an organization analogous to the St John's Ambulance Association, a voluntary agency established in 1877 to provide ambulance services and first aid training for the general public.[36] The object of the exercise was not to turn patients and nursing practitioners into 'amateur doctors', but to recruit 'volunteer aids' to the medical profession.[37]

The medical response to the *Control of a Scourge* suggests that scepticism about the early detection message was more widespread than one might assume. When the book appeared in 1906, an anonymous reviewer in the *Medical Press* found little to commend it. The title was 'uninforming'; the subtitle 'objectionable, and, as some will doubtless aver, misleading'.[38] As for the content, it was weakened by a 'dogmatism which must oftentimes bring disappointment'.[39] The writer conceded that the book's aims were admirable, but he thought that the upbeat message smacked of 'a youthful optimism hardly born of experience': the claim that cancer was curable by early operation simply did not reflect the realities on the ground. The *Lancet* had made much the same point in response to Mayo-Robson's 1904 call for a 'crusade' against uterine cancer:

> We fear, from the way in which the question is sometimes discussed, that some surgeons encourage the thought that cancer is certainly curable by operation if only it be attacked in its early stages …We do not think it is in accordance with known facts to say that, if only all cases of malignant disease were treated by the surgeon as soon as a diagnosis was satisfactorily arrived at, they would all be cured.[40]

To sum it all up, the public could not be entirely blamed for their reluctance to undergo operations 'upon grounds that must to some extent be speculative'.[41]

The First Campaign Against Uterine Cancer

The idea of a campaign against uterine cancer came up for discussion at the annual meeting of the BMA, held in Leicester in 1905. As mentioned in the last chapter, Wertheim was one of the invited speakers. In his epoch-making address Wertheim referred to Winter's campaign, urging colleagues to follow his example. Wertheim thought that education would not completely eliminate the need for extensive operations, since patients dreaded operative treatments, and some women would not agree to surgery until their condition had reached an advanced stage. He had some hope that the situation might improve, as more patients were persuaded to consult early, and better methods of diagnosis became available.[42] In the ensuing discussion, however, a number of participants expressed concerns that education of the lay public would fan 'cancerphobia'. Two more years thus passed before the leaders of the BMA began to consider in more detail what should be done to secure the earlier recognition of uterine cancer.

At the 1907 annual meeting of the BMA London obstetrician Herbert Spencer introduced a discussion on the subject by criticizing all those who held pessimistic views about uterine cancer: ‘Pessimistic views … do much harm by inducing in the mind of the public and the profession an entirely erroneous view that cancer is incurable, and lead to delay in seeking medical advice, which would be of little consequence were it true that cancer is incurable.’[43] Participants in the debate blamed delays in diagnosis on a number of factors, variously identified as ignorance of the symptoms that might suggest cancer of the cervix and uterus; fears about the disease; women’s reluctance to submit to intrusive gynaecological examinations; visits to ‘quacks’; shortcomings in the teaching of gynaecology; and general practitioners’ tendency to temporize with medicinal treatment.[44] The outcome of the discussion was that a committee, chaired by the London gynaecologist Frederick McCann, was appointed to investigate the problem.

Differences of opinion about the means of spreading the educational message were in evidence from the very start. Most gynaecologists agreed that practitioners, nurses and midwives should be taught to recognize the early signs of uterine cancer, but only a few thought that the educational effort should speak to women as well. The main concern was that any scheme of public education would spread ‘cancerphobia’. This was deemed to be almost inevitable, given the supposed propensity of the British public to morbid introspection and hypochondria. As anxiety and mental depression were widely thought to predispose people to cancer, it was clearly important that the profession should not contribute to the death rate by fanning undue fears about the disease. Frederick McCann was particularly worried about the danger of ‘cancerphobia’. At the BMA 1905 conference he had protested against the proposal to ‘scatter broadcast leaflets’ detailing the symptoms of uterine cancer, claiming that ‘it would tend to produce a state of mental unrest which might, indeed, originate the disease which it was intended to remedy’.[45] The result was that when the BMA Committee finally produced a scheme in 1909, no provision was made for the instruction of women.[46] Doctors and midwives were targeted instead.

The omission of laypeople from the scheme was criticized by a number of commentators. Plymouth surgeon C. Hamilton Whiteford pointed out that improving practitioners’ diagnostic skills would not bring sufferers to the doctor’s surgery: patients themselves needed to be aware of the warning signs of cancer.[47] An editorial in the *Lancet* also regretted the limited scope of the campaign, arguing that doctors exaggerated the dangers of 'cancerphobia'. A dose of fear, the journal argued, may not be such a bad thing: it was preferable that a large number of women should consult the doctor unnecessarily in the fear that they may have cancer, than a still larger number should neglect its early signs and symptoms.[48]

By the early 1910s there were signs that public health practitioners were beginning to take an interest in the matter. The first public health campaign was in Portsmouth (southern England), and it was instigated by Charles Childe, who had lived and practised in the town for many years. Childe wielded considerable influence on municipal affairs as a councillor and a member of the town's Health Committee. With the support of the city's Medical Officer of Health (MOH), Dr Mearns Fraser, in 1914 he obtained Council approval for an educational scheme. The Portsmouth campaign is important because it included for the first time 'accessible' cancers that were not gender-specific, i.e. cancer of the skin, rectum, lip and mouth (although the latter two were thought to be more common in men). Building on expertise gained through the campaigns against TB and venereal disease (VD), the public health department spread the anti-cancer message through lectures, leaflets and notices in the local press. The literature described the symptoms that might mean cancer in various sites. It promoted immediate medical consultation, and hygienic measures aimed at preventing the habits and conditions that might predispose to the disease. Women were a particular target of the campaign, not only as potential cancer victims, but also as educators. Nurses, midwives, health visitors and social workers often had the first opportunity to advise people about matters of health. They thus formed a key link between doctors and the wider community, particularly in deprived areas.[49]

On the eve of the Great War, MOHs were responsible for launching similar publicity campaigns in Birmingham, Leicester, Bradford, Birmingham and the borough of Holborn in London.[50] When war broke out, however, schemes aimed at the public proved difficult to sustain. In Portsmouth, for example, the insertion of notices in the local press was discontinued on grounds of economy.[51] The local authority continued, however, to distribute printed information to nursing bodies, midwives and other workers among the poor. This might seem to reveal a fundamental lack of commitment to lay education, but it can also be seen as a way of making maximum use of scarce resources: case-finding during contacts with patients was a more cost-effective intervention than a large-scale press campaign. It is unclear what impact these early campaigns actually had, as no attempt to evaluate outcomes was ever made. Twelve years after the Portsmouth campaign, Mearns Fraser himself could not tell what the effect of the work had been, apart from the fact that he had been informed by some surgeons that 'in a certain number of cases' patients had consulted early after reading the notices.[52]

Public Education Between the Wars: The Changing Context of a Contested Idea

After the end of the First World War, rising death rates from cancer and the growing belief that the trend reflected an actual increase in incidence, rather than better diagnosis, served to unleash a new wave of anxiety about the disease. As both lay and medical commentators called on the government to take action, the *Medical Officer* revived the idea, first proposed in 1899, that a Royal Commission should be established to investigate the 'cancer problem'.[53] Pleas for a parliamentary inquiry were unsuccessful, but in February 1923 the Ministry of Health (a government department formed in 1919) set up a Cancer Committee 'to consider available information with regard to the causation, prevalence and treatment of cancer and to advise as to the best method of utilizing the resources of the Ministry for the study and investigation of the problem'.[54]

Another new development in 1923 was the establishment of the British Empire Cancer Campaign (BECC). Founded on the initiative of London surgeon Percy Lockhart-Mummery and other leading metropolitan clinicians, the Campaign aimed to launch a 'frontal attack' against cancer as a preliminary to finding its causation and cure. As Austoker and Cantor describe, its establishment attracted rivalry and even hostility from the ICRF, the Middlesex Hospital and the Medical Research Council (MRC) – the main source of state funding for medical research in Britain.[55] Despite these controversial beginnings, the Campaign became a successful fund-raising body, which annually distributed support to a wide range of university medical schools, hospital laboratories and individual workers engaged in every aspect of cancer research.

Professional axieties about cancer mortality prompted calls for a national programme of lay education. Advocates contrasted England's feeble attempts to mount a public campaign against the disease with the vigorous efforts of the American Society for the Control of Cancer (ASCC): 'In America they do things differently', London surgeon Joseph

Adams declared in 1922. ‘They have a powerful Society for the Control of Cancer, and much work is being done by it to enlighten the public as to its early signs and the dangers of delay. The power of the press and the pulpit are both being utilised in this good cause.’[56] Founded in 1913 by a group of prominent East Coast practitioners and wealthy laypeople, the ASCC had shown little interest in research, focusing instead on public education as a key strategy for cancer control.[57] In 1921 the Society had launched a new initiative: National Cancer Week. During ‘Cancer Week’, a deluge of pamphlets and other forms of propaganda spread the ‘Message of Hope’ – early detection – and free tumour clinics were set up for the purpose of diagnosis and advice.[58] The centrepiece of the first Cancer Week was a public-education movie, *Reward of Courage*, which featured the first breast self-examination.[59] Motion pictures on a wide variety of health issues had been produced in America since the early 1910s, but this was the first time that the new medium had been used as a means of educating the public about cancer.[60]

Interwar enthusiasm for early detection and mass educational campaigns was not confined to the United States. In Europe both France and Germany introduced more far-reaching interventions into the behaviour of the population. Public education in France was a focus of activity for the *Ligue Contre le Cancer*, an organization established in 1918 to tackle the problem of cancer amongst older soldiers. The *Ligue*’s efforts were initially limited to the dissemination of advice in the large Paris theatres, and the production of a poster to publicize the ‘do not delay’ message. In 1930, however, the organization intensified its campaign by launching a ‘cancer week’. Working in collaboration with the Social Health Office, the League endeavoured to reach a wider audience by using press articles, posters, touring lectures and a public-education movie soberly entitled *Cancer*.[61] In neighbouring Germany, early detection became state policy under the Nazi regime. As Proctor describes, radio and newspaper announcements urged women to undergo regular screening tests for cervical cancer, and men were advised to get their colons checked as often as they would check the engine of their car. Leaflets were distributed amongst physicians to alert them to the value of early detection, and cancer counselling centres were established in most cities, both to popularize the ‘do not delay’ message and to advise sufferers about therapeutic options.[62]

In 1922 Joseph Adams argued that a new national organization should be established in Britain to beef up the modest educational schemes already established by a few local health departments. Adams urged

English practitioners to use the ASCC as a model: 'Cancer week … sounds horrible', he admitted in a letter to the *Lancet*, but 'with our present lack of precise knowledge it is the most satisfactory road to success in treatment'.[63] Writing at a time when the British post-war economic boom was rapidly turning into bust, Adams appreciated that such a society may be an unaffordable 'luxury' for the nation. He thus came up with the idea of using the British Red Cross to disseminate the anti-cancer message.

Adams publicized his views at a meeting of the Royal Society of Medicine, held in London in March 1923. He hoped to persuade the Society to establish a Standing Committee to advise the British Red Cross, but his views aroused little enthusiasm in his audience. Charles Childe welcomed the suggestion, but he acknowledged that a scheme of 'direct instruction' might exceed the limits of what was reasonable or acceptable for the large majority of practitioners.[64] As an alternative, he suggested that nurses and midwives should be more widely trained in the recognition of uterine cancer, and that the St John's Ambulance Association should give lectures, similar to those given on simple emergencies, about the early signs of cancer in 'obvious' situations. Childe thought that the lectures should target clergymen, clergymen's wives, health visitors, district nurses, and any other individual who was regularly in contact with the 'poor and ignorant'.

Pioneering educationist Dr Mearns Fraser saw the use of voluntary organizations as an encroachment on the work already undertaken by the public health department: 'surely the essential bodies above all to enlist in any campaign were the local health authorities', he was quoted as saying in response to Adams; 'these were already possessed of medical and sanitary staffs and had all the machinery for getting in touch with the public ready to hand'.[65] The most effective propaganda work could thus be secured only through them.

Adams's proposals were also criticized on clinical and scientific grounds. An editorial published in the *Lancet* for 1922 set out four arguments against the introduction of a mass educational campaign.[66] First, early detection was not true prevention, since it did not prevent the incidence of cancer. Second, no amount of propaganda could reduce the large number of inoperable cases of cancer of the internal organs, which were notoriously difficult to diagnose. Third, the expression 'early diagnosis' was misleading, since no one knew when cancer began, and detection was only possible when the disease was already well established. Fourth, the only treatment for 'early' cancer was a crippling or disfiguring operation, which was not even guaranteed to cure the disease. In sum, all that one could reasonably hope to achieve by means of an educational campaign was to prolong by a few years the lives of *some* people, who might otherwise have delayed medical consultation.

Leading London clinicians asserted that cancer research was more deserving of public support than lay education. Cecil Rowntree, pioneering cancer surgeon and BECC trustee, asserted in 1923 that 'the real cancer problem was the problem of its cause and cure, and no amount of educational propaganda or legislative enactments would help in this direction … What was wanted was, firstly, more generously endowed, and, secondly, more intensive and more highly organized research work.'[67] Lord Dawson of Penn, the eminent physician, emphasized that 'research into the causes of cancer must always stand in the forefront of the programme'. He conceded, however, that 'while the results of that research were awaited, some means must be found of getting existing cases under treatment as early as possible'.[68]

Much of the opposition to campaigns modelled on 'Cancer Week' centred on the belief that the dissemination of graphic images of cancer would fan 'cancerphobia'. British clinicians were especially wary of using mass media of communication, such as films and radio broadcasts. Public education movies had been produced in Britain for the campaign against VD but, according to Lord Dawson, it was vitally important that anti-cancer initiatives should not copy too closely the campaign against VD. If broadcasting and cinemas were employed, he declared in 1923, 'the effect would be to create an unhealthy atmosphere, and to concentrate public attention on lurid and morbid subjects so that more harm than good might be done'.[69] Other physicians and surgeons claimed that 'American-style' mass-media campaigns did not suit the British national character. As Leeds gynaecologist James Young argued in 1925, 'other schemes of permeation' were more appropriate in the UK.[70]

Anxieties about large-scale campaigns reflected in part broader concerns about mass culture and the 'Americanization' of British society. During the interwar period leading British writers, scholars and commentators identified mass culture with the American way of life. They worried that the enormous success of American cultural imports, particularly the dance hall and the picture palace, would eventually undermine and erode British values.[71] British distrust of the commercial media was interwoven with anti-labour and anti-democratic fears, and buttressed by new theories of social psychology which stressed the vulnerability of mass audiences to outright manipulation.[72] Top clinicians and members of the upper-middle-class intelligentsia both feared and despised the masses, which they frequently compared to animals or children.[73]

During the 1920s leading British clinicians thus continued to endorse indirect methods of instruction, targeting nurses, midwives and general practitioners rather than the general public. This tendency to channel anti-cancer information and guidelines through intermediate health professionals was also a feature of anti-cancer campaigns in the Netherlands. As Snelders and colleagues describe, between 1910 and 1950 Dutch cancer specialists insisted that public communications about the disease would cause cancerphobia; they thus 'consistently tended towards the direction of paternalism, and away from popularization of knowledge about cancer'.[74]

Paternalism was undoubtedly a factor in Britain, but also of significance was a widespread pessimism about the potential of education to reduce cancer mortality. Leading medical commentators emphasized that initiatives such as 'cancer week' promised too much: 'We should not raise false hopes among the public by suggesting that such an effort is in any way likely to control or even to combat cancer', the *Lancet* admonished doctors in 1922.[75] Many clinicians also thought that there was no point in teaching people about the symptoms of malignancies with a reputation for incurability, no matter how early they were diagnosed: 'Of what avail was it to educate the public to the pitch of recognizing the early stages of cancer of the oesophagus, liver, lung or pancreas, or the first signs of melanoma or periosteal sarcoma?', surgeon Cecil Rowntree was reported as saying in a commentary to Adams's proposals. 'Could anyone present save the lives of patients in these cases be they ever so early?'[76] There was no answer to his question.

Confusing Messages

If British cancer experts resisted calls for public information campaigns, they also accepted that the funding needs of cancer research made direct communication with the public a necessity. Anti-cancer agencies relied on the political and financial support of the public in order to sustain expanding research programmes. In order to persuade people to part with their money, some information about what cancer was, and how it might be combated, had to be conveyed to the public. How did British anti-cancer agencies tackle the challenge? Despite contemporary concerns about ‘cancerphobia’, the fund-raising literature produced in the 1920s by research organizations demonstrates that leading clinicians were not averse to dramatizing the horrors of cancer in certain contexts. In 1922, for example, an editorial in the *Lancet* drew attention to a handbook for the lay public, published in aid of the Cancer Research Fund of Ireland: ‘Here we have an association of general health propaganda with the advertisement of a special fund, and the blend is perilous’, the author asserted.

> With detailed information as to the pathology and prognosis of special forms of cancer there are included fuller descriptions of symptoms than can be considered necessary for lay reading, accompanied by illustrations of advanced cases which are not nice to look at. It is doubtful whether it is kind or wise to excite more horror than already exists, and whether such provocation will lead to the desired result – financial support for the Cancer Research Fund of Ireland.[77]

Appeals based on fear did more harm than good, critics argued, not only because they could undermine the fund-raising effort itself, but also because they had the potential to weaken public health messages promoting early treatment: excessive fear of the disease could deter people from seeking prompt medical advice, ultimately driving sufferers into the arms of ‘cancer curers’ once their condition had become too advanced for orthodox treatment. The leaders of the BECC recognized the problem in the mid-1930s, when they belatedly agreed to establish a Propaganda Committee to coordinate both the educational and fund-raising activities of the Campaign. Concerns about the alarming tone of the Campaign’s existing fund-raising literature prompted the suggestion that the appeal and educational material should be separated.[78] This proposal was eventually implemented after the Second World War, when the Propaganda Committee was reconstituted as the Cancer Education Committee. The material intended for public education was then rewritten to express a more optimistic outlook, with an emphasis on early diagnosis and curability.[79]

In the post-war period the BECC also took steps to tone down the ‘fear’ element in its fund-raising appeals. In a letter to an American supporter, written in 1949, the Campaign’s General Secretary F. B. Tours explained why the organization was wary of using shock tactics and media ‘blitzes’ to further its cause:

> It is our experience to date that the public will always respond to an appeal for cancer. We are confident that if we cared to launch a 'fear' campaign we could raise very large funds in a short time. But these funds would give no guarantee that the problem would be solved, and within a few years they would therefore dry up, as the public would grow tired of listening to the Campaign's cry of wolf. We therefore feel it better not to attempt to raise funds by such spectacular methods, but to continue to preach a gospel of hope which enables the work of this Campaign to go forward steadily and unsensationally.[80]

The BECC's emphasis on the 'gospel of hope' was reflected in a propaganda poster created in 1947 for the Campaign by Abram Games, the celebrated British graphic designer (Fig. 4.1). Games was famous for his ability to weave different ideas together with a great economy of means: some of the most memorable graphic images of mid-twentieth-century Britain were his work.[81]The BECC poster significantly uses the ghostly profile of a woman to symbolize the nation's hopes and fears about cancer. The head is simply outlined against the background of a grey sea. The eyes and lips are half closed, as if in an attitude of prayer, and the gaze is directed towards the sky, which is coloured in an uplifting shade of yellow to signify hope for the future. Just below the figure a pair of hands are depicted in the act of releasing a bird, again symbolizing Britain's hopes of defeating cancer. The caption makes the message explicit in a few simple words: 'Help us give hope'. Games's great achievement was to acknowledge present realities without losing sight of the ultimate goal. The menacing sea and ethereal profile are there to remind the viewer of the grim toll of death and suffering exacted by cancer. But by subordinating the fear-inspiring elements to the 'message of hope', the overall composition leads to one conclusion: cancer will be curable one day.

Public Campaigns and Service Provision

Proposals for a national anti-cancer campaign were problematic in the interwar years also because they raised difficult questions about the diagnostic and therapeutic facilities that would be needed in order to make the effort worthwhile. Concerns about the relationship between propaganda and service provision began to emerge in the early 1920s, when central government began to formulate its policy about cancer. As noted earlier, in 1923 the Minister of Health appointed a Departmental Committee on

Fig. 4.1 Abram Games: propaganda poster for the British Empire Cancer Campaign, 1947 (Courtesy of Naomi Games)

Cancer to analyse all the available evidence about the disease. By agreement with the MRC, the Committee focused on ‘applied research’ or ‘field work’, as opposed to ‘pure’ research. The term ‘field work’ referred to a comparatively new line of research, which aimed to gain fresh insight into the causation and treatment of cancer by bringing together the expertise of clinicians, surgeons, health administrators and statisticians, either at a local or at a national level.[82]

The formation of the Committee on Cancer happened to coincide with the beginning of a period of retrenchment in public spending, brought about by the collapse of the post-war economic boom. Prominent businessmen blamed the recession on reckless government expenditure, and in 1921 Lord Rothermere, the newspaper proprietor, founded the Anti-Waste League to campaign against ‘wasteful’ government expenditure. Three of its members successfully fought by-elections, winning seats from government supporters. In an effort to take the sting out of the anti-waste agitation, in August 1921 Prime Minister Lloyd George appointed Sir Eric Geddes to head a committee of businessmen to advise him on departmental spending. In its reports, presented to the Cabinet in December 1921 and January 1922, the Committee recommended economies totalling £87 million (the so-called ‘Geddes Axe’). The Cabinet decided on savings amounting to £52 million. The result was that total social spending, including health, fell from £205.8 million in 1920–1 to £182.1 million in 1921–2. A further dip to £175.5 million in 1923–4 was followed by a modest recovery in 1924–5, but the sum allocated to social spending (£177.4 million) remained well below 1920–1 levels.

Against this background, the Ministry of Health’s approach to the cancer problem was to encourage more efficient use of existing resources. In its first memorandum, issued in 1923, the Committee on Cancer stated that the government was not contemplating the establishment of a state-funded cancer service analogous to the services for TB or VD. What was suggested instead was the establishment of local Cancer Committees to coordinate the work already undertaken by different local agencies. MOHs were encouraged to take a lead in developing cancer schemes in the areas for which they were responsible, particularly with regard to propaganda, and the collection of mortality and morbidity data.[83] The members of the Committee on Cancer decided that central government action in matters of propaganda was not desirable, partly because of the expenditure it was likely to involve, partly because of fears that it might provoke ‘cancerphobia’. There was also some caution about the claim that cancer was curable by early operation. Chief Medical Officer George Newman observed that it would be difficult to convey a balanced view of the cancer problem through a national campaign: ‘there may be no single “key” to the problem of cancer … the inculcation of hygienic habits of life is one of the most hopeful ways of approaching the task of prevention’, he asserted at one of the first meetings.[84]

In response to the suggestions of the Committee on Cancer, special Cancer Committees were formed during the mid-1920s in a number of county boroughs.[85] But leading public health officials warned that more resources would be needed if the anti-cancer propaganda was to be effective. According to the *Medical Officer*, the experience with TB and VD demonstrated that ‘mere propaganda to awaken a need for a special service, in the absence of adequate facilities to supply the service to rich and poor alike, defeats its own ends’.[86] C. Killick Millard, MOH for Leicester in the East Midlands of England, claimed that cancer was a low priority for central government:

> It is felt to be somewhat of an anomaly that whilst large sums of public money are being spent upon such diseases as scarlet fever, smallpox, etc., which cause only a trivial mortality, practically nothing is at present spent on cancer, which has become at once the most formidable and the most dreaded of all the danger to life.[87]

In both Britain and the United States there was also some anxiety that a broader campaign would infringe on the activities of other medical agencies. Such concerns proved well founded when public health officers attempted to establish publicly funded diagnostic clinics. On both sides of the Atlantic, private practitioners resisted the establishment of cancer clinics as a threat to their autonomy and income. In Britain it was the BMA that took up the issue on behalf of the profession. When the public health departments in Leicester and Greenwich opened diagnostic clinics in the late 1920s, its Medico-Political Committee complained that the clinics were bypassing the referral system and poaching patients.[88] Similar problems arose in the United States when public health services and voluntary associations such as the ASCC began to promote and support the establishment of cancer detection clinics. ASCC activists vigorously campaigned for the establishment of specialized cancer hospitals and detection clinics from the late 1930s through to the late 1940s. The Women’s Field Army (WFA), the Society’s educational arm, raised money for cancer detection clinics, and it encouraged people to use them.[89] But the great majority of private practitioners and gynaecologists greeted these efforts with scepticism and suspicion. Although most physicians had little interest in cancer detection, many regarded the clinics as potential competitors and a Trojan horse for socialized medicine.[90]

Gender, Cancer and the Medical Officer of Health

In Britain limited budgets for cancer care prompted both local and central government to prioritize prevention and early diagnosis over the treatment of advanced malignancies. In this context the 'accessible' cancers became the main focus of interest for the Ministry of Health, despite the fact that stomach cancer was known to be the chief cause of cancer mortality when the two sexes were taken together, and that the mortality rate of stomach cancer in men was as great as the combined mortality of breast and uterine cancer in women. Health officials regarded stomach cancer a poor target in the war on cancer, not only because it frequently caused no symptoms until it was quite advanced, but also because many of its symptoms resembled those of less serious conditions.[91] A public health campaign against stomach cancer might have fanned cancerphobia by prompting anyone suffering from heartburn or indigestion to imagine they had cancer. Similar considerations led to the exclusion of ovarian cancer from public information campaigns and popular medical literature aimed at women. Ovarian cancer did not offer much hope for cure because it was usually discovered too late: it was a 'silent killer' which caused either no symptom in its early stage, or complaints similar to those of lesser diseases.

Public health intervention with regard to the accessible cancers was informed by the principles of 'preventive medicine', an inclusive concept that embraced the entire realm of medical and health-related action: from the prevention of habits and conditions that might predispose to the disease, to the prevention of its debilitating effects in the individual. In 1931, a report of the Committee on Cancer noted that cancer of the cervix, breast, mouth and skin offered ample scope for the application of preventive medicine. Anticipating modern distinctions between primary, secondary and tertiary prevention, the report identified three main areas of preventive intervention: prevention of environmental and lifestyle causes; curative treatment of abnormal conditions likely to favour the development of cancer; and treatment of the actual disease, enabling the body to return to normal.[92] This inclusive model of prevention reflected MOHs' growing responsibilities for the preservation of the nation's health: as is well known, by the early 1920s the scope of public health work had expanded well beyond concerns with sanitation and housing, to include a growing range of personal health services: from clinics for maternity and child welfare, to hospital facilities for acute cases. Indeed, as Webster notes, the system was already occasionally called a 'National Health Service' in policy discussions.[93]

MOHs' journals from the 1920s reflected the widening scope of public health work with regard to cancer. MOHs were responsible for public education and the investigation of the social and environmental aspects of the disease. They liaised with scientific and medical experts, coordinated diagnosis and treatment, and oversaw arrangements for referral, follow-up and after-care of cases.[94] Following the reorganization of Poor Law medical services in 1929, local authorities were empowered to provide cancer treatment for patients. Enthusiasm for deep X-ray and radium therapy stimulated the establishment of treatment facilities in a number of municipal hospitals. In the early 1930s a few of these were recognized as national radium centres, under the scheme established in 1929 by the National Radium Commission.

The emphasis on local provision inevitably led to wide variations in the quality of services across the country. Government health officials themselves recognized the unevenness of existing arrangements: 'In reviewing this brief outline of public action in England, and its recent developments', Sir George Buchanan said at the International Conference on Cancer, held in London in 1928, 'one is conscious of its patchwork, incompleteness, and even its inconsistencies and overlaps'.[95] On a more positive note, the system contained at least 'the elements of elasticity and capacity of development on almost every side, whether in pathology, causation, diagnosis or treatment, as occasion requires'.[96] Some MOHs regarded this elasticity as a distinct advantage. According to Robert Veitch Clark, MOH for Manchester and founding member of the Manchester Cancer Committee, medical and public health responses to the disease needed to take account of local conditions: it was not 'practicable to suppose that any hard and fast line of action should be laid down for development in all cities or counties', he said in 1928.[97] Besides, it was 'highly disadvantageous so to sterilize individual enterprise or imagination at the outset'.[98] Policies which encouraged the development of services at the local level enabled MOHs to carry out their work with minimal interference from central government, creating new opportunities for innovative practitioners like Clark.

The accessible cancers were of interest to government health officials not only because they were easier to diagnose, but also because their prevention could be grafted onto the structure of local healthcare already in place for maternity, child welfare, VD and TB.[99] Maternity, TB and VD clinics were seen to be especially important for the secondary prevention of cancer of the cervix, skin and tongue, since these malignancies had been associated, respectively, with childbirth injury, cutaneous TB and VD. In 1931 the Committee on Cancer drew attention to the preventive work undertaken by the local authorities: 'Examples occur in the efforts of improved care of women in childbirth upon cancer of the uterus, of treatment of syphilitic sores upon cancer of the tongue and perhaps other organs, of treatment of tubercular affections of the skin and of improved working conditions upon cancer of the skin.'[100] Maternity and child welfare clinics were key sites for the dissemination of information about breast and uterine cancer, and they also played a limited part in the detection of established tumours of the breast and uterus.[101]

The focus on accessible cancers had one important consequence: it led to the marginalization of men in representation and debate. Women seemed to form a disproportionate portion of the population that could be helped by education for two related reasons. First, breast and uterine cancer were the most prominent of the accessible cancers. Second, cancer in men was peculiarly associated with malignant diseases of the gastrointestinal tract, which were of no interest to public health officials. In a well-argued historical article, Melling and Dale note that English men were not well served by interwar public health policies against cancer:

> MOHs employed by local authorities rarely displayed an overt bias in their commitment to serving females in cancer services but the logic of the services which developed under their charge led, inexorably if indirectly, to unequal opportunities for cancer diagnosis and treatment.[102]

This gendered approach to cancer can be partly understood in terms of the fiscal and institutional constraints faced by both central and local government in the 1920s and 1930s. Cancer was a growing problem, but it was only one of many diseases competing for public funds. The need for administrative efficiency suggested that a selective approach, targeting the more 'promising' cancers, may yield better returns than broad-based interventions.

AN ALTERNATIVE MODEL: THE YORKSHIRE CAMPAIGN

This chapter has so far emphasized how the leaders of the main anti-cancer organizations rejected calls for a national education programme, invoking the danger of cancerphobia and the potential of such campaigns to breach the canons of good taste. The territory left vacant by voluntary organizations was gradually occupied by MOHs, encouraged by the Ministry of Health after 1923. An important exception to the general trend from 1925 onwards was the educational campaign established in Yorkshire, a historic county of northern England, and the largest in Britain. The history of this campaign reveals tensions between the London clinicians who controlled the BECC and their provincial colleagues. It also highlights a largely overlooked aspect of the history of health education in Britain: the role played by Insurance Committees. Established in 1911 to oversee the working of the National Insurance Act, the Insurance Committees represented doctors, local authorities and 'approved mutual societies'. They were the first bodies given statutory powers to undertake health education campaigns, and a good many of them made use of their powers, despite limited budgets, by funding lectures, health weeks and exhibitions.

The history of the Yorkshire campaign starts in 1925, when the future Lord Moynihan, then a senior surgeon in the Leeds Royal Infirmary, became concerned to establish a provincial cancer research organization that might act as a counterweight to the political hegemony of the London clinicians who controlled the BECC. Moynihan launched a campaign to raise funds for cancer research in Yorkshire. This led to the formation of the Yorkshire Council of the BECC, and of a Department of Experimental Pathology and Cancer Research in the University of Leeds.[103] The Yorkshire Council enjoyed autonomous status from the parent organization. It was thus able to determine its own programme, frequently in open disagreement with the policies adopted in London.

The local Insurance Committees made a large donation to the Yorkshire Council, on the condition that the sum be spent on propaganda and education. A propaganda subcommittee was thus established to work out a scheme. The Yorkshire Council's campaign targeted both doctors and the lay public. Each practitioner in the County was sent a short book on cancer.[104] Postgraduate courses were held to keep GPs up to date with the latest developments in cancer research and treatment, and lectures and health exhibitions for the general public were organized up and down the County. In 1928 Dr G. B. Hillman, MP for Wakefield and chairman of the Yorkshire Council, poured scorn on those who fretted about 'cancerphobia': 'the fears of "frightening people to death", of "creating a nation of neurasthenics", do not impress the members of our Council', he commented. 'Our leader's happy phrase – "frightening them to *life*" appeals to us more strongly.'[105]

Yorkshire activists fully appreciated the difficulty of making educational events attractive without resorting to gruesome details. This dilemma was commonly resolved by presenting the subject within the context of general health advice. Lectures with titles such as 'The Beginnings of Disease, or a Stitch in Time' served to plant the information within a wide variety of health-related matters, thus defusing any fears people might have harboured about the disease.[106] The occasional lapse into sensationalism was perhaps inevitable. At a Health Exhibition held in Hull (East Yorkshire) in the mid-1920s, for example, the cancer stall organized by the Yorkshire Council had a background representing the 50,000 lives claimed every year by the disease. The death toll was represented by a sinking ship, while a few boats pulling away symbolized those saved by early treatment. In order to emphasize the ignorance and mystery that still surrounded cancer, the whole scene was enshrouded in fog; a lighthouse with the light endeavouring to pierce the gloom signified the effort of medical research. The dangers of delay were illustrated by the picture of a lady descending steps to a cemetery; each step signified one month, and the total number of steps represented the average number of months that elapsed between the noticing of a lump in the breast and the seeking of medical advice. Juxtaposed to this grim picture was the 'message of hope': a radiant woman, 'cured' by early operation. Microscopical preparations showing both normal and malignant tongue tissue samples were also provided in an effort to attract public interest.[107] The results of all this activity are impossible to determine, as the Yorkshire Council made no attempt to evaluate outcomes. Dr W. Allen Daley, MOH for Kingston-Upon-Hull, reported in 1928 that 'more and more patients' were asking for medical examination in his area.[108] This modest, anecdotal evidence of change was regarded as reason enough to continue with the educational effort.

The BECC Finally Enters the Field

During the early 1930s BECC leaders came under increasing pressure to lay their anxieties about cancerphobia aside and introduce public education into the Campaign's programme. The BECC's move into education was instigated by one of its members, the gynaecologist and radium therapy pioneer Malcolm Donaldson.[109] Donaldson believed that fear, prompted by ignorance of what cancer was, caused people to delay seeking medical advice.[110] He rejected the view that education would increase popular anxieties about the disease, claiming that knowledge was the antidote to fear. Donaldson also supported the introduction of annual check-ups for apparently well people – a strategy already well established in the United States, but widely opposed in Britain as a potential cause of cancerphobia. Donaldson strongly disagreed, and in 1932 he started the Anti-Cancer Education League to promote his views.[111] His efforts to get BECC backing for the venture proved unsuccessful. In 1934, however, the Campaign's leaders finally agreed to establish a Propaganda Committee, and Donaldson was appointed to work out a pilot scheme.

Earlier in this chapter I mentioned the WFA and the part it played as the educational arm of the ASCC. In the years immediately before and after the Second World War, lay activists spread information about all cancers, informing both men and women about the risk of the disease. In Britain, however, the experience of using laypeople as fund-raisers proved a barrier to their employment as educators: members of the Propaganda Committee objected that, on occasion, the lectures given for appeal purposes had given alarming accounts of the cancer problem.[112] The Propaganda Committee was readier to trust to doctors to give a sober account of the matter. The BECC scheme thus placed the GP at the heart of the educational effort. Speaker panels were organized in a number of southern counties, and an outline was prepared to guide the presentations. Lectures were a popular educational method, partly because they could be tailored to suit different audiences, partly because they offered an opportunity to address individual concerns about the disease. The lecture format also served to emphasize the importance of personal communication between doctor and patient, reinforcing the authority of the physician as the source of expertise about cancer.

Lecturers for the BECC campaign were invited to focus on breast and uterine cancer, especially if the public was feminine: 'by contrast, it is a poor idea to speak about stomach cancer. There is no early diagnosis, and people with slight indigestion will believe they have cancer.'[113] In an effort to widen its reach, the scheme targeted local associations, such as women's clubs and community organizations. Encouraged by the success of the pilot scheme, the Propaganda Committee subsequently extended its scope to men's organizations, but male audiences proved difficult to attract: arguably three decades of woman-centred anti-cancer propaganda had persuaded British men that cancer was indeed a female disease.[114]

Under Donaldson's direction, the Propaganda Committee cautiously experimented with modern methods of mass communication, producing a 'talkie' (i.e. a sound film) entitled *Out of the Shadow* (1938). In 1928 the BECC had produced a film as part of its publicity campaign, but it was on a subject (the cultivation of living cells) which had proved to be of scant public interest.[115] *Out of the Shadow* fell into a different genre. Scripted by Donaldson and produced by Gaumont-British for the BECC, the film dramatized the 'do not delay' message by wrapping it around a domestic story capable of arousing interest and sympathy in the viewer.[116] The title of the film alludes to the importance of bringing cancer 'out of the closet', of replacing ignorance with knowledge. It also refers to the process of bringing people's fears of the disease to the surface: the transition from ignorance to knowledge brings relief from fear, shown here to be the main obstacle to early diagnosis.

The film begins with shots of an audience at a lecture on the history of the medical fight against disease. The lecturer draws people's attention to the advances already made in the control of many diseases once regarded as incurable. He emphasizes that one day cancer will doubtless be added to the list of curable diseases. But a hidden force hinders doctors' efforts to conquer this disease: fear. The movie next shows a series of vignettes alluding to the most common forms of malignancy, while the voice-over urges people not to hold back from seeking medical help. The remainder of the film develops the main theme by focusing on a young wife who thinks she may have breast cancer. She is shown suffering in silence for days on end, scared of telling her husband or her doctor. Over dinner one evening she finally breaks down and confesses. The husband urges her to be sensible, and he insists she see the doctor at once. In the consulting room the doctor praises the woman for coming to see him before it is too late. Off-screen, the lump is successfully removed. The tumour is benign but, the doctor warns, it might have progressed to cancer if left alone. The patient is delighted: now cured of her potential cancer as well as of her fear, she can look to the future with optimism and confidence.

Out of the Shadow was shown around the country in conjunction with the special lectures for the laity organized by the BECC.[117] It focused on breast cancer partly because women were the main audience of these lectures, partly because breast cancer was one of the 'accessible' malignancies, widely associated with the hopeful notion of curability. As women were deemed to be more likely to be irrational in the face of cancer than men, breast cancer also provided a means of illustrating the attitudes and behaviours which, to Donaldson's mind, hindered the anti-cancer effort in general. The protagonist's fearful response to the threat of cancer provides a stark contrast to the husband's measured, reasoned approach: he has already taken on board the message that early cancer is curable, and it is his timely intervention that saves the woman. The movie is thus particularly noteworthy for its attempt to assert both medical and male authority over women's emotional responses to cancer. Compliance with medical advice secures both peace of mind and a clean bill of health: cancer control and emotional control are shown to go together. *Out of the Shadow* is less forthcoming about the nature and consequences of the treatment. In the interwar period women diagnosed with either a pre-cancerous or a malignant condition of the breast would have been advised to undergo a radical mastectomy. Yet the movie contains only the vaguest allusion to the treatment received by the protagonist: lifting the veil of secrecy and shame surrounding cancer does not mean complete and truthful disclosure.[118] As one of Donaldson's contemporaries, the eminent surgeon Sir Cecil Wakeley, reportedly stated in 1950, instruction in the early stages of cancer might be justifiable and important, but frank discussions of the details of the treatment were a mistake: when the 'mystery' went out of surgery 'the patient often lost a great deal, and much of his co-operative confidence disappeared. A description of his impending operation might be stimulating to one patient and make a nervous wreck of another.'[119] Besides, full disclosure of the treatment might have deterred sufferers from consulting early. There was plenty of evidence that people were as worried about the prospect of 'mutilating' surgery as they were about the threat of cancer. It was thus prudent to deflect public attention away from an issue that might have frightened potential sufferers into inaction.

Post-War Developments

Out of the Shadow marked the high point of BECC support for lay cancer education. When war broke out, the Propaganda Committee was discontinued. Practical obstacles, such as wartime paper restrictions, generally hampered the educational effort. After the war Donaldson and others expected the organization to resume its educational activities, but the Campaign's leaders proved reluctant to get involved. In 1946 the Central Council for Health Education (CCHE), a small body which produced health education materials and trained health education personnel, approached the BECC and the Ministry of Health to see if they would collaborate on the production of cancer education material.[120] While the Ministry of Health and the CCHE held talks on their respective roles, the BECC reconstituted its pre-war Cancer Propaganda Committee, renaming it the Cancer Education Committee (CEC). The Committee met under Donaldson's chairmanship to discuss possible lines of action. After lengthy discussions, the CEC submitted two proposals: an intensification of the Campaign's pre-war scheme, and the introduction of a small 'test' scheme of education aimed at the lay public. The BECC's Executive Committee agreed that the Campaign should not organize a scheme of lay education without the support of the medical profession as a whole. A questionnaire was thus sent to all GPs, asking whether they thought that lay education 'would be of assistance in securing the earlier diagnosis of cancer, and thereby improving the chances of cure'.[121] More than 5000 GPs responded out of the 20,000 who had been contacted: 2148 believed that a programme of lay education would be worthwhile, 2683 thought not, and 222 qualified their yes or no answer. In view of this result, the Executive Committee concluded that the matter required further thought.[122] In 1954 the BECC decided to focus on its traditional concern with research and, much to the surprise of North American observers, it withdrew from the field of public education.[123] Enquiries about cancer education were henceforth redirected to the CCHE.

BECC caution was prompted partly by fears that a national campaign might adversely affect its fund-raising efforts, partly by concerns about its implications for the National Health Service (NHS). The NHS was ushered in on 5 July 1948 to provide the entire population of the UK with a system of healthcare free at the point of delivery. The new service had barely begun before it was overtaken by a crisis over expenditure. As the government struggled to reduce costs, and charges were introduced for prescriptions and ordinary dental treatment, BECC leaders worried that a national anti-cancer campaign would boost public demand for services, placing an additional burden on harried GPs and busy hospitals. After a tour of North American research, clinical and organizational centres in 1948, BECC officials noted that cancer detection centres in the United States had long waiting lists. This served to reinforce the long-standing conviction that an American-style campaign did not suit British conditions: 'Laudable as is the object of this campaign', F. B. Tours commented in 1949,

> its method clearly shows the different requirements of different countries. It seems to us that the American publicity has an underlying "fear" motif … The British public would not react favourably to such a motif. In our view any approach to the British public must be through hope rather than fear. Our public should be brought to appreciate the vital factor of early diagnosis without creating cancer phobia which will cause many healthy people to seek overhaul too frequently.[124]

Ministry of Health officials shared this anxiety. In 1949, for example, a memorandum drawn up by Ministry of Health closed by stating that 'the number of cases coming up for diagnosis and found not to be suffering from cancer might be increased very substantially', and asking: 'Could the hospitals cope with the situation?'[125] Post-NHS discussions about cancer education in policy-making circles thus ended with the reaffirmation of the approach already established in Britain since the early twentieth century: a cautious endorsement of small, local schemes, under the aegis of local authorities and voluntary bodies.[126]

Notes

1. Park, 'Further Enquiry'.
2. 'The Early Recognition of Uterine Cancer', p. 164.
3. Ibid.
4. Ibid.
5. Patterson, 'Cancer, Cancerphobia, and Culture'; Toon, 'Cancer as the General Population Knows It'.
6. Milligan, 'The Crusade against Cancer of the Uterus'.
7. 'The Early Diagnosis of Uterine Carcinoma'.
8. Lockyer, 'The Result of a "Fight against Cancer" in East Prussia'.
9. Sampson, 'The Importance of an Early Diagnosis in Cancer of the Uterus', p. 1586.
10. Quoted in Milligan, 'The Crusade against Cancer of the Uterus', p. 62 (translation mine).
11. Lewers, *Cancer of the Uterus*, pp. 5–6.
12. 'The Prevention and Treatment of Cancer (Editorial)'.
13. Robson, 'The Bradshaw Lecture on the Treatment of Cancer', p. 1506.

14. Constable, 'The Historiography of the Crusades'; Alexander, *Medievalism*; Siberry, *The New Crusaders*; Phillip, *Holy Warriors*, esp. Chapter 12.
15. Historical accounts of specific health crusades, particularly the Temperance and Purity crusades, are too numerous to mention. For an overview of health-reform crusades in America, see Engs, *The Progressive Era's Health Reform Movement*.
16. On Morris's career and interest in TB, see 'Obituary: Sir Malcolm Morris, KCVO, FRCS'; Philip, 'Malcolm Morris Memorial Lecture'. Morris also played a pivotal role in the campaign against venereal disease. In the early 1910s he was the first to advocate the appointment of a Royal Commission on VD, and he subsequently became vice-president of the National Council for Combating Venereal Disease (NCCVD), the educational organization that grew out of the 1916 Royal Commission on Venereal Disease.
17. On the NAPC see Bryder, *Below the Magic Mountain*; McCarthy 'The Key to the Sanatoria'; Worboys, 'Before McKeown', esp. pp. 155–7. In 1919 the NAPC changed its name to 'National Association for the Prevention of Tuberculosis'. On the American campaign, see Tomes, *The Gospel of Germs*.
18. Broadbent, 'The Prevention of Consumption and Other Forms of Tuberculosis', p. 252.
19. Morris, 'Editorial (Cancer Special Issue)', p. 363.
20. Ibid.
21. Worboys, *Spreading Germs*, esp. Chapter 6.
22. Morris and others advocated the formation of research networks analogous to those already established by observatory workers; see Morris, 'Editorial (Cancer Special Issue)', p. 363. On observatory networks and their significance as models for twentieth-century scientific research, see Aubin, Bigg and Sibum, 'Introduction: Observatory Techniques in Nineteenth-Century Science and Society', esp. pp. 15–18. Cancer laboratories and institutes actively encouraged visits from foreign workers, and they participated in a globalized network of oral and written communications. For an example see Austoker, *A History of the Imperial Cancer Research Fund 1902–1986*, p. 59.
23. 'The Cancer Society'. For a contemporary survey of cancer research in the UK, see 'Organization of Cancer Research'. On the Middlesex Hospital Cancer Laboratories, see Coupland, 'The

Cancer Charity of the Middlesex Hospital, 1792–1902', pp. 33–7. On the ICRF, see Austoker, *History of the Imperial Cancer Research Fund*.

24. Gould, 'The Bradshaw Lecture on Cancer', p. 1844.
25. Childe, *The Control of a Scourge*, p. 239.
26. 'Cancer and the Public Health'.
27. Childe, *The Control of a Scourge*, p. 229.
28. Ibid.
29. Ibid., p. 280.
30. Ibid., p. 236.
31. One of Childe's reviewers thought, however, that the focus on accessible cancer was too narrow; 'Cancer – a Human Scourge'.
32. Milligan, 'The Crusade against Cancer of the Uterus'.
33. Ibid., p. 56.
34. 'The Public Appreciation of the Dangers and Treatment of Cancer', p. 39.
35. Ibid., p. 230.
36. Ibid., p. 231–4.
37. Ibid., p. 235.
38. 'Cancer – a Human Scourge', p. 657.
39. Ibid., p. 658.
40. 'The Public Appreciation of the Dangers and Treatment of Cancer', p. 40.
41. Ibid.
42. 'Section of Obstetrics and Gynaecology: Discussion on the Diagnosis and Treatment of Cancer of the Uterus', p. 695.
43. Spencer, 'Discussion on Measures', p. 432.
44. Practitioners failed to appreciate that ability to pay the doctor's bill may have determined whether a woman consulted the doctor or not. Also absent from this early debate was any discussion of the diagnostic and treatment facilities that would be required in order to fulfil the promise of the educational message.
45. Spencer, 'Discussion on Measures to be Adopted', p. 438.
46. For the full text of the appeal, see 'The Early Recognition of Uterine Cancer' (BMA Scheme).
47. Whiteford, 'The Early Recognition of Uterine Cancer'.
48. Ibid.
49. Childe, 'Cancer, Public Authorities, and the Public'.

50. ‘Public Propaganda against Cancer: Manifesto and Leaflet of the Leicester Health Department’; Hall-Edwards, ‘Education of the Public as to Cancer’; Millard, ‘Cancer Clinics’.
51. Champneys, ‘Cancer’, p. 13.
52. This information was given to Champneys, MOH for Willesden (Greater London); Champneys, ‘Cancer’, p. 13.
53. ‘Wanted: a Royal Commission on Cancer’. The establishment of a Royal Commission on cancer had been previously advocated by the Cancer Society; see ‘Increase of Cancer’; ‘The Cancer Society’. The government of the day turned down the request, on the grounds that the subject belonged principally ‘to the domain of science’; ‘The Government and the Death Rate from Cancer’.
54. The National Archive (TNA), Minutes of the Departmental Committee on Cancer, 5 February 1923.
55. On the establishment of the BECC, see Austoker, *History of the Imperial Cancer Research Fund*, pp. 76–90; Cantor, ‘The MRC’s Support for Experimental Radiology’.
56. Adams, ‘Cancer and the Public’.
57. On the ASCC, see Triolo and Shimkin, ‘The American Cancer Society and Cancer Research Origins and Organization’; Gardner, *Early Detection*, pp. 23–9; Patterson, *The Dread Disease*, pp. 91–4.
58. On Cancer Week, see Soper, ‘Value of Public Instruction’; Rush, ‘Some Results of National Cancer Week’. See also Patterson, *The Dread Disease*, pp. 91–4.
59. On the ASCC’s enthusiasm for the movies see Cantor, ‘Uncertain Enthusiasm’. By 1929 the ASCC had released a total of five movies, including a British film on the cultivation of living cells.
60. On the use of film as educational tool, see Fedunkiw, ‘Malaria Films’; Pernick, *The Black Stork*; Reagan, Tomes and Treichler (eds.), *Medicine’s Moving Pictures.*
61. Pinell, *Fight against Cancer*, pp. 167–8. The publicity did not produce general panic as some had feared, although it did increase the number of worried people who sought medical advice. In order to tackle the fears of the ‘worried well’, in 1932 the organizers introduced a radio talk on ‘cancerphobia’.
62. Proctor, *The Nazi War on Cancer*, p. 29.
63. Adams, ‘Cancer and the Public’; Adams, ‘Urgent Need for Education in the Control of Cancer’.
64. ‘Urgent Need for Education in the Control of Cancer’, pp. 34–5.

65. Ibid, p. 39.
66. ‘Cancer (Editorial)’.
67. ‘Urgent Need for Education in the Control of Cancer’, p. 37.
68. Ibid., p. 35.
69. Ibid., p. 36. These concerns were not entirely unjustified. In 1937 the American weekly *Life* provoked a public outcry when it published graphic images of skin cancer to illustrate the progress of cancer therapeutics; Lederer, ‘Dark Victory’, p. 101.
70. Young, ‘Education of the Public as to Cancer’.
71. Abranavel, *Americanizing Britain*. On music and cinema in this period, see Miles and Smith, *Cinema, Literature & Society*; Nott, *Music for the People*.
72. Carey, *The Intellectuals and the Masses*; Le Mahieu, *A Culture for Democracy*.
73. Cantor, ‘Representing the Public’.
74. Snelders, Meijman and Pieters, ‘Cancer Health Communication in the Netherlands’, p. 278.
75. ‘Cancer (Editorial)’. The *Lancet* did not spare cancer research organizations from such criticisms. When the BECC’s manifesto was published in 1923, the journal objected to the idea that a ‘frontal attack’ would lead to the solution of cancer’s mystery: ‘has scientific medicine reached the stage when the attack can best be delivered in this way? … Before now enthusiasts speaking in the name of medicine have promised more than could be fulfilled’; ‘The Appeal for Cancer Research’.
76. ‘Urgent Need for Education in the Control of Cancer’, p. 37.
77. ‘Cancer: its Causes and its Cure’, p. 236.
78. CMAC, SA/CRC/A.22/1, BECC Propaganda Committee. Minutes 28 March 1935.
79. CMAC, SA/CRC/A.31/1, BECC Cancer Education Committee. Minutes 10 March 1950.
80. CMAC, SA/CRC/Q.1/6, F. B. Tours to Mrs E. Hutton, 21 September 1949.
81. For a biography, see Games, Moriarty and Rose, *Abram Games*.
82. See the correspondence between Fletcher and Newman, TNA FD 1/2037. ‘Field work’ was essentially a form of teamwork; see ‘The Health Organization of the League of Nations: the Work of the Cancer Commission’.

83. TNA, FD 1/2037, Departmental Committee on Cancer, Memorandum No. 426.
84. TNA, MH 55/47, Minutes of the Departmental Committee on Cancer, 16 March 1923.
85. Cancer Committees were established in Manchester, Sheffield, Leeds, Birmingham, Bradford, Nottingham, Leicester, Bristol and Cardiff; see Champneys, 'Cancer', pp. 12–15.
86. 'The Cancer Problem from the Public Health Standpoint', p. 90. The article had originally appeared in the *American Journal of Public Health*.
87. Millard, 'Cancer Clinics', p. 575.
88. CMAC, SA/BMA/C.178, BMA Medico-Political Committee. Cancer Clinics, 1929. See also Champneys, 'Cancer', p. 20.
89. Gardner, *Early Detection*, pp. 74–85.
90. On the cancer detection clinic movement in the United States, see Aronowitz, *Unnatural History*, pp. 211–16.
91. TNA, MH 55/47, Minutes of the Departmental Committee on Cancer, 12 June 1928. See also Moynihan, 'Cancer of the Stomach'; Spriggs, 'Early Recognition of Cancer of the Stomach'.
92. TNA, MH 55/48, Minutes of the Departmental Committee on Cancer, 3 December 1931.
93. Webster, *The Health Services since the War*, vol. 1, p. 8.
94. For a discussion of the contribution of MOHs to cancer prevention and treatment, see Melling and Dale, 'Medical Officers of Health'. See also Domenech and Castañeda, 'Redefining Cancer during the Inter-War Period'.
95. Buchanan, 'Collective Public Effort in Dealing with Cancer', p. 555.
96. Ibid.
97. Clark, 'Research and Public Education', p. 582.
98. Ibid.
99. *14th Annual Report of the Ministry of Health*, p. 83.
100. TNA, MH 55/48, Minutes of the Departmental Committee on Cancer, 3 December 1931.
101. Limited because peri- and post-menopausal women, who were most at risk from breast and uterine cancer, were not included; Dummer, 'Cancer of the Cervix'.
102. Melling and Dale, 'Medical Officers of Health', p. 559.
103. Palladino, *Plants, Patients and the Historian*, pp. 107–8.

104. Hillman, '"Fussing over Cancer"'.
105. Ibid., p. 480.
106. Ibid.
107. Daley, 'What the Public Should Know about Cancer'.
108. Ibid., p. 580.
109. See CMAC, SA/CRC/A.22/1, BECC Central Propaganda Committee, Minutes.
110. Donaldson, 'Early Diagnosis of Cancer'.
111. CMAC, SA/CRC/R.1/3, 'Pioneer Health Centre'.
112. Donaldson did not share his colleagues' anxieties; Donaldson, 'Cancer of the Cervix'.
113. CMAC, SA/CRC/Q.1, 'Advice for medical lecturers who speak to the lay public', 1936.
114. Historian Leslie Reagan notes a similar trend in the United States; Reagan, 'Engendering the Dread Disease'.
115. Filmed by the British pathologist R. G. Canti, the movie was the first to use time-lapse photography of cells grown in culture. It was shown in America by the ASCC, but it generated little public interest, and it was subsequently shown mostly to medical audiences; Cantor, 'Uncertain Enthusiasm', p. 45. On Canti and tissue culture in interwar Britain, see Squier, 'Life and Death at Strangeways'; Wilson, 'The Early History of Tissue Culture in Britain'.
116. The film was directed by Andrew Buchanan. A copy is available from the British Film Institute, London.
117. Donaldson, 'Publicity for Preventive Medicine'.
118. Reticence about radical surgery was also a feature of the public education movies produced by the ASCC in the interwar period. As Cantor has argued, anti-cancer activists in America tended to underplay any aspect of the disease and its treatment which they feared might work against their message; Cantor, 'Uncertain Enthusiasm'. See also Krueger, '"For Jimmy and the boys and girls of America"',
119. 'Westminster Medical School'.
120. For a detailed account of these negotiations, see Toon, 'Cancer as the General Population Knows It', pp. 121–3.
121. CMAC, SA/CRC/R.1/4, F. B. Tours, January 1953.
122. Horder, 'The General Practitioner and Lay Education in Cancer'.
123. On learning about the BECC's new policy, a Canadian gynaecologist expressed surprise about 'this difference between the approach

to cancer prophylaxis in Britain and North America'. CMAC, SA/CRC/Q.1/3, Edwin M. Robertson to F. B. Tours, 10 May 1955.

124. CMAC, SA/CRC/Q.1/6, Tours to Mrs Hutton, 21 September 1949.
125. TNA MH 55/927, 'Cancer Education: Memorandum by the Ministry of Health' (draft, October 1949).
126. Toon, 'Cancer as the General Population Knows It', pp. 122–3.

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CHAPTER 5

The Gendered Politics of Radiotherapy

Public health campaigns against cancer were boosted in the late 1920s by new hopes about the efficacy of radium therapy: ‘Radium better than Knife: Cancer Optimism’, newspaper headlines declared in 1928.[1] The greatest excitement was generated by the results of radium therapy of cervical cancer: ‘It is now universally acknowledged that the treatment by radium is the best possible treatment in cases of cancer of the womb, and that surgical operation, in this form of cancer, is no longer advisable when radium can be obtained’, the *Times* newspaper asserted in 1928.[2] Gynaecologists were later to acknowledge the historical significance of the radium treatment of cervical cancer. In an article published in 1954, London gynaecologist Frank Cook wrote: ‘To quote Malcolm Donaldson (1933): “Gynaecology was the realm in which radium therapy was first used to any great extent; and in this field it still has its greatest value.” It has more recently been said with a considerable degree of truth that the history of radio-therapy of cervical cancer well represents the history of radio-therapy as a whole.’[3] This chapter examines how the new modality was added to surgery, the mainstay of treatment in the early 1900s: as an adjunct until the late 1920s, then as an alternative and, from the late 1940s onwards, as part of a combined approach to the treatment of cervical cancer. I explore the part played by a number of important actors: surgeons, radiologists, health officials, statisticians, philanthropists, the lay press, and women themselves.

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Pickstone has highlighted the importance of systematic differences between modern treatment modalities for cancer. He has also drawn attention to the way in which differences between health polities in different countries have affected the cumulation of modalities, with long-term consequences for the development of services and specialization.[4] These differences were especially important for interwar radiotherapy. In the UK a network of radiotherapy centres emerged during the 1930s under the control of a quango named the National Radium Commission. In this chapter I highlight the role of the MRC's Radiology Committee in advancing the centralizing agenda, focusing on the part played by one of the research schemes developed in the mid-1920s under its aegis: the Radium Research scheme organized by the London Committee of the Medical Women's Federation (MWF). By the late 1920s the scheme had evolved into a special hospital for radium therapy, entirely staffed by medical women, which was later to become famous for its outstanding success with the radium therapy of cervical cancer. I argue that radium therapy was a gendered issue not only because of its association with a 'woman's disease', but also because of its connotations as a feminist cause, closely linked with Marie Curie, the discoverer of radium, and the work of women practitioners. I show how radiotherapy served to further the professional interests of women doctors: as a source of employment for female practitioners, a justification for their utility in medicine, and evidence that women doctors were equal, if not superior, to male colleagues as clinicians and scientists.

The Dawn of Radiation Therapy: X-rays

Discovered by Wilhelm Röntgen in 1895, X-rays attracted enormous media coverage and public excitement when the first and most famous of X-ray images – that of Frau Röntgen's hand, complete with an eerily 'floating' wedding ring – appeared in the Viennese newspaper *Neue Freie Presse* on 5 January 1896.[5] Clinicians immediately realized the value of the 'new photography' as a diagnostic aid. Within four months of Röntgen's discovery, X-rays were used to diagnose fractures, and to locate bullets and needles lodged in bodies. The discovery that X-rays had biological effects was the result of clinical accident. Shortly after the introduction of diagnostic X-rays, a number of practitioners reported that patients had suffered from hair loss, erythema and dermatitis, which could only be attributed to the action of the rays.

The belief that X-rays had some relationship to radiant heat and to light, both natural and artificial, prompted dermatologists to seize upon this discovery as a tool for the treatment of a range of skin conditions which had proved resistant to treatment by light and by electricity.[6] Success with rodent ulcer and lupus vulgaris (a form of cutaneous tuberculosis) raised hopes that X-rays might prove beneficial in cases of skin cancer. The established treatment modality for skin cancer was surgery, but in the early 1900s X-ray therapy was added as a means of tackling inoperable malignancies and other lesions that were difficult to remove without causing significant disfigurement or 'mutilation'.[7] Practitioners found that X-ray therapy appealed to patients because it did not involve hospitalization or a long convalescence. Some suggested that, as an alternative to dreaded surgery, X-ray therapy may help further doctors' efforts to persuade cancer sufferers to consult early.

The striking improvements shown for patients with superficial cancers led to the application of X-rays to less accessible tumours. Uterine cancer was an obvious target, both because most patients arrived in the doctor's surgery when the disease was too advanced for operative treatment, and because attempts to improve its operability were proving extremely controversial. Clearly there was need for an alternative to the scalpel. The first British reports sounded a note of caution, however. The *Journal of Obstetrics and Gynaecology* first mentioned X-ray therapy in 1904, when it reported on cases of vaginal and breast cancer treated by radiation; both types of malignancy had shown only a slight response to the treatment.[8] The following year obstetrician John Shields Fairbairn, in a review of X-ray therapy in obstetrics and gynaecology, commented: 'so far, nothing has been proved of the value of the rays as a therapeutic measure'.[9]

The breakthrough in the therapeutic use of X-rays came with the development of a technique which used high-energy rays in the treatment of deep-seated tumours. German gynaecologists were among the first to experiment systematically with deep therapy, beginning in 1909. Bernhard Krönig and Carl Gauss, of Freiburg-im-Breisgau, began to use deep therapy as an alternative to oophorectomy, to destroy the function of the ovary in cases of uterine fibroids. Krönig and his associates (later known as the 'Freiburg School') subsequently broadened the scope of the method to an increasing number of conditions, including uterine cancer, with highly promising results. In 1913 Krönig presented his results at the 15th Congress of the German Gynaecological Society in Halle. This congress was a landmark in the application of X-ray therapy to gynaecological cancer. According to Walter Stoeckel, gynaecologist at the Charité Hospital in Berlin, it was a memorable occasion because of the jubilant atmosphere which spread 'right up to the most senior *Geheimräte*'.[10] Prominent gynaecologists such as Albert Döderlein, Ernst Bumm and Carl Menge asserted that they would give up the knife if the results were confirmed by further studies. In 1914 the *BMJ* reported that in the university hospital of Munich, where Döderlein was Professor of Obstetrics and Gynaecology, cases of cervical cancer were no longer being treated by operation.[11]

The work of the Freiburg School provided the basis for the technique developed by gynaecologist Ludwig Seitz and physicist Hermann Wintz at the University Women's Hospital at Erlangen. From 1914, Seitz and Witz treated dozens of cases of carcinoma and sarcoma, as well as cases of uterine fibroma and of functional uterine bleeding. The Erlangen technique rapidly became known abroad as the 'German' style of therapy. Within Germany it faced a great deal of opposition, however, as many practitioners regarded it as excessively dangerous and schematic. Opposition also came from practitioners who disagreed with its basic objective, which was to kill cancer cells.[12]

The Freiburg method was introduced into Britain before the Great War by the gynaecological surgeon Louisa Martindale. A fluent German speaker, Martindale had the means to finance visits to Freiburg to acquire deep X-ray therapy apparatus and learn how to use it. Martindale worked in collaboration with London gynaecologist Lionel Provis, one of the English pioneers of the application of radiology to gynaecology. After the war, she visited Erlangen and, fired with enthusiasm for the 200,000 Volt X-ray apparatus, she adopted the method, with help from one of the Erlangen doctors. In her autobiography, published in 1952, Martindale observed that the therapy appealed to many 'doctors, headmistresses and other professional women as well as others who disliked to face an operation involving hospitalisation and a long convalescence, and – what to some is a serious matter – the loss of the uterus'.[13] The Erlangen technique nonetheless attracted little professional support in Britain before 1920. This was due partly to concerns about its dangers and inflexibility, partly to anti-German sentiment in the period immediately before and after the Great War. The other reason was that the great majority of surgeons and gynaecologists did not control X-ray therapy. In Germany treatment with X-rays, radium and mesothorium (a substitute for radium) was carried out by surgeons and gynaecologists in departments attached to surgical and gynaecological clinics. German specialists argued that cancer was a disease of a specific organ; as such, it should be treated by those who were experts in that particular domain.[14] Louisa Martindale thought that this attitude was perfectly reasonable: ‘Careful and accurate diagnosis is the main factor in obtaining success’, she observed in her autobiography; ‘and for this reason, it was held in Freiburg that the treatment should be carried out by the gynaecologist in an X-ray therapeutic department attached to a gynaecological clinic’.[15] In Britain, on the other hand, X-ray therapy was a service provided mostly by radiologists working in medical electricity departments. Gynaecologists were loath to refer patients for treatment, and they showed little interest in the technique. Louisa Martindale was not surprised: ‘A surgeon is naturally anxious to treat the patient himself’, she observed, ‘and it was not the British custom to equip gynaecological clinics with their own X-ray facilities’.[16] British gynaecologists and surgeons proved more receptive to another type of radiation therapy, developed in Paris in the early 1900s: radium therapy.

The Dawn of Radiation Therapy: Radium

The discovery of spontaneous radioactivity came on the heels of Röntgen’s work. In February 1896 French physicist Henri Becquerel fortuitously stumbled upon this phenomenon while using naturally fluorescent minerals to study the properties of X-rays. In contrast to Röntgen’s X-rays, though, Becquerel’s ‘uranium rays’ achieved only modest press coverage. It was not until Pierre and Marie Curie discovered polonium and radium, and linked the production of radium with possible medical and industrial applications, that the phenomenon of spontaneous radioactivity began to attract public attention.

The first clinical applications of radium occurred in dermatology. Practitioners began by treating non-malignant conditions such as lupus erythematosus, then moved on to treat cancerous conditions.[17] The value of radium in dermatological disease was famously demonstrated in 1907, when Malcolm Morris successfully treated King Edward VII for a rodent ulcer. The king was so pleased with the result that he asked two friends, Lord Iveagh and Sir Ernest Cassel, to give £50,000 each to found an institute for radium treatment in London, the first of its kind in Britain.[18] It would indeed be difficult to overestimate the role played by dermatologists in the early development of radium therapy. Perhaps the largest contribution was made by Louis Wickham and Paul Degrais, the French ‘radium martyrs’, who co-authored in 1909 the first textbook exclusively devoted to radium therapy.[19] Wickham and Degrais went on to establish a laboratory for the study of biological effects of radium, later used as a model for many of the radium institutes established in Europe and America. The book and the work carried out at the Laboratoire Biologique du Radium laid the foundation of modern radium therapy.

Clinicians who were already using X-rays therapeutically were attracted to radium both because it did away with the costly and bulky installations used for X-ray therapy, and because it could be applied more accurately to the place requiring treatment. One of the earliest forms of radium applicators was a linen cloth ('toile') covered with granules of resin containing radium. This was rapidly superseded by metal plaques containing radium salt held in a resin base; by fine tubes made of glass, platinum, gold or silver which could be placed in intra-cavity spaces; and by tiny glass or gold containers encapsulating radon gas ('seeds'), which could be implanted directly into the tumour. In addition to these methods, radium emanation and 'radium water' (i.e., water impregnated with radium) were used in the treatment of a vast array of non-cancerous conditions – from rheumatism to gout.

Radium therapy enjoyed an initial phase of almost unqualified enthusiasm between 1903 and 1906, followed by a period of scepticism among physicians and surgeons who thought its benefits had been exaggerated. In 1909 Henry T. Butlin, the father of British head and neck surgery, urged practitioners not to send patients to Paris for radium treatment merely in the hope that it may 'do some good'.[20] Mindful of the rapid rise and demise of wonder cures such as Koch's much-hyped Tuberculin remedy, Butlin feared that radium therapy might prove another damaging fiasco: 'Berlin did a fine business while the craze lasted', he observed, 'but many of the patients spent more than they could afford to do on a treatment which was purely experimental, while others died miserably in hotels and lodging-houses'.[21] In 1914 enthusiastic press articles about the work of American radium therapy pioneers Robert Abbe and Howard Kelly prompted the distinguished French surgeon Eugène Doyen to condemn radium therapy as 'a gigantic fraud, practiced on the public and the medical profession by unscrupulous financiers'.[22] Radium therapy survived these attacks and gradually recovered after 1914 with a more realistic appreciation of its potential, which seemed high in the treatment of some dermatological conditions, cancerous growths and arthritis.

The most important feature of radium treatment in England before the First World War was that it was generally not carried out in specialist departments, or by practitioners who specialized in radium therapy. Radium was used in dermatological and electrical departments for the treatment of surface lesions, often in conjunction with other ray treatments. It was also used by surgeons in both hospital and private practice for the treatment of deep-seated tumours. Pickstone has called this system the 'liberal model' of radiotherapeutics: a form of organization where all significant hospitals had radium therapy, X-ray therapy was an annex of diagnostic radiology and radiologists did not control beds. At the London Radium Institute, the director was responsible for working out the specifics of the treatment, but the diagnosis was the responsibility of the referring doctor, who thus retained his or her right to determine the suitability of the case for radium therapy. Furthermore, when the method of treatment required specialized skill, such as the insertion of radium into the uterus, the Director was required to hand over the patient to the appropriate specialist.[23] As Pickstone notes, this was essentially 'philanthropic provision of an expensive treatment in a way that did not disrupt the normal patterns of private and charity medicine': it fitted the liberal model.[24]

Radium in Gynaecology

The development of intra-cavity and interstitial techniques (a form of radiotherapy now defined as brachytherapy) brought cervical cancer within the range of diseases amenable to treatment by radium. The American electrotherapist Margaret Abigail (Abbie) Cleaves is generally credited with being the first to use the method in a case of cervical cancer. A medical graduate of Iowa State University, Cleaves was the founder of the Electro-Therapeutic Laboratory and Dispensary in New York, and an active member of the American Association of Electro-Therapeutics. In 1903 she reported using a quantity of borrowed radium to treat a patient diagnosed with inoperable cervical cancer. The radium salt, which was contained in a tube, was placed inside the glass water-jacket of a vaginal X-ray tube, then inserted for five minutes on two consecutive days. Five days later, all the symptoms of the disease had disappeared. Cleaves was impressed by the simplicity of the treatment as compared with X-ray therapy. The main problem with using radium, she thought, was its cost and scarcity. She feared that this was bound to restrict the availability of the therapy.[25]

The first surgeon to use radium in a case of cancer of the uterine cervix was Robert Abbe, an American practitioner best known for contributions to plastic surgery.[26] A friend of the Curies, in 1903 he acquired 150 mg of radium barium chloride from Marie Curie and he began to study its effects in cases of surgical interest, chosen from those refusing operation or beyond the aid of the knife. He treated his first case of cervical cancer in 1905, and by the early 1910s he had extended radium therapy to the treatment of a wide range of both malignant and non-malignant conditions. [27] British gynaecologists began to report cases of uterine cancer treated by radium from 1906, noting that the treatment produced a marked reduction in symptoms, but not the hoped-for cure.[28]

Radium rapidly found a niche in gynaecology as a palliative in inoperable cases, and as an alternative to surgery in cases where the patient either refused operation, or was unsuitable for operative treatment on account of age or some other condition.[29] In 1911 the first report of the London Radium Institute stated that a total of thirty-nine cases of uterine cancer had been treated during the Institute's first year of activity; three patients had been discharged apparently cured, nineteen were 'improved'.[30] By 1914, news of the method developed at Stockholm's Radiumhemmet (Radium Home), a private hospital founded in 1910 by radiologist Gösta Forssell and surgeon John Berg, was beginning to reach England. Forssell and his collaborator, the English-born gynaecologist James Heyman, had developed a therapeutic regime (later known as the 'Stockholm method') which was proving very effective in cases of inoperable cervical cancer.[31] Enthusiastic visitors wrote of patients entering the institution pale, debilitated, and with the offensive discharge typical of late cancer of the cervix. A little later the same patients were seen to leave the hospital in perfect health, without any sign of malignant disease, and with a growth of new tissue in place of discharging ulcers.[32] In 1919 Heyman read a paper before the Swedish Medical Society on the radium treatment of inoperable cervical cancer, as judged over a period of five years or more.[33] He showed that approximately 27 per cent of the cases treated since 1914 could be considered cured, and that the primary mortality was only 2.1 per cent. Commenting on the figures, leading Swedish gynaecologist Hjalmar Forssner prophesized that before long, the surgeon would have to hand the field over to the radiologist.[34]

Gynaecologist Howard Kelly, one of the 'Big Four' founding professors at Johns Hopkins Hospital in Baltimore, played an important role in the establishment of radium therapy in the US.[35] Kelly's interest in radium dated from 1908, when he bought a small tube containing a few milligrams of radium and started to use it in the treatment of minor external lesions. He had a successful result in the treatment of a recurrent cervical epithelioma but, according to his collaborator Curtis Burnam, he did not fully appreciate the therapeutic potential of radium until he heard about the work of the Laboratoire Biologique du Radium in Paris. In 1909, during a visit to the United States, Wickham gave an address on radium therapy before the Johns Hopkins Society. Kelly was so impressed that he purchased 100 mg of the element from the Banque du Radium in Paris and, in collaboration with Burnam, he began to apply it in cases of uterine cancer, angioma and epithelioma of the skin. The results were so encouraging that Kelly and Burnam determined to purchase more radium and extend the work to include extensive deep-seated malignancies. Kelly's enthusiasm for radium therapy raised more than a few eyebrows both within and without the United States. He was denounced as a quack and charged with professional misconduct.[36] Undeterred by the controversy, he committed considerable financial resources to the purchase of radium and to the development of domestic radium processing operations. By 1920 the amount of radium at his private hospital was the largest available in any one clinic in the world. The Howard Kelly Hospital pioneered the use of radium in packs at a distance from the skin ('telecurie therapy'), and it was one of the first in America to install an apparatus for deep X-ray therapy. For many years it administered all of the radiation for patients of the Johns Hopkins, and it did most of the radiation work in Baltimore and the State of Maryland.[37]

Radium therapy was not entirely benign, however. Radiation damaged normal cells, causing early adverse reactions, and sometimes late sequelae. Fatigue, nausea, skin burns, oedema of legs, abdominal and skeletal pain, vesico-vaginal and recto-vaginal fistulas were regularly reported in the medical literature. Fistulas could be repaired surgically, but treatment was not always successful, particularly after radium therapy. It must also be emphasized that some of the methods of radium therapy developed in the 1920s involved invasive surgical procedures (the so-called 'surgery of access', or 'radium surgery'). The Radium Institute of Brussels, for example, introduced a technique for the treatment of cervical cancer, which consisted of incisions through the pelvis and blunt dissections of tissues, followed by the insertion of radium containers directly into the growth.[38] This technique became very popular in Britain, despite the fact that it was associated with a high risk of infection. Yet practitioners were reluctant to face up to the dangers of radium therapy, and in their public pronouncements they did nothing to correct the popular view that treatment with radium was risk-free for the patient.

Standardizing Therapy

In 1919 a literature review of radium therapy for cervical cancer compiled by Henry Janeway, head of the Radium Department at New York's Memorial Hospital, concluded that radium was clearly the treatment of choice for uterine malignancies of 'doubtful operability', and that there was also 'strong evidence' that its use was justified in cases of operable cervical cancer.[39] The case for radium rested not only on its safety, efficacy and convenience for the patient, but also on its usefulness as a means of solving problems of surgical manpower. Doctors dealt with thousands of cases each year, Janeway argued, but the number of surgeons capable of performing the radical abdominal operation was too small to meet the demand for treatment. The methods of radium therapy, on the other hand, could be used by anyone possessing the simplest gynaecological training, after a relatively short period of instruction.[40] Radium therapy thus provided a means of making cancer treatment available to the masses – an important point at a time of anxiety about rising cancer mortality.

The question of standardization of radium therapy began to emerge in Britain in the early 1920s. Growing optimism about the potential of radium therapy encouraged an increasing number of surgeons, gynaecologists and general practitioners to take up radium. This surge of enthusiasm was not universally welcome. The death of certain prominent radiologists after prolonged exposure to radium and X-rays, and public anxieties about the dangers of radiation in inexpert hands, fanned anxieties about 'uncontrolled' use of radium.[41] A related worry was that the wide availability of radium in the form of tubes ('seeds') would lead to amateurish attempts to treat cancer with insufficient quantities of radium, thus robbing some patients of their chance of a cure, and fostering undue pessimism about radium therapy.[42]

Increasingly from about 1920 onwards, advocates of specialization in radium therapy criticized the empirical use of radium as unscientific: 'If progress is to be made along this promising line of treatment', the *Lancet* commented in 1920, 'the operator must form a clear conception of what he is doing, and why he is doing it; of the changes likely to occur and the approximate time of their development. For purposes of collective investigation some standardisation of methods is essential.'[43] The concern with standardization was not confined to radium therapy. In early twentieth-century Britain standardization was a national obsession, associated with the heavily debated issues of efficiency, rationalization and scientific management.[44] As standards and standard-setting generally concerned activities that were of benefit to the nation, calls for the standardization of radium therapy served to link expertise with the public good, setting the expert apart as an honest broker in matters related to the evaluation of therapeutic efficacy.[45]

The kind of investigation advocated by the *Lancet* was difficult, however, not only because radium was a scarce and costly commodity, but also because the production of routinized and standardized knowledge entailed turning the clinic into a laboratory for the study of human disease. Therapeutic research required teams of dedicated workers with their own independent laboratories. It also required clinical investigators to have control over the admission and management of the patients they wished to study. The problem before 1920 was that clinicians who advocated systematic research in radium therapy did not control the material and social resources they needed to accomplish their scientific aims. Radiotherapeutic research in Britain's voluntary hospitals was hampered by a shortage of funds; by lack of control over 'clinical material'; by the professional marginality of radiology; and by the pressures imposed on clinicians' time by the conflicting demands of teaching and private practice.[46]

The opportunity to put British radiological practice on a firmer footing arose in 1919, when the MRC acquired 5g of radium bromide from surplus government stock. The acceptance of this offer placed the MRC in a position of considerable influence on the future direction of radiological research in Britain. The MRC initially offered the entire amount to the Middlesex Hospital for research in radiotherapy. The Middlesex seemed the obvious choice because of its considerable research and treatment record, and because it was the only hospital in the country with a full-time physicist. Furthermore, cancer researchers at the Middlesex had already signalled their intention to concentrate their work on the therapeutic application of X-rays and radium.[47]

The MRC radium was to be used for the first British experiment in teleradio- (or 'telecurie') therapy, using an apparatus which the British called the 'radium bomb' from the appearance of the box in which the radium was sealed. Eighteen months after the start of the project, however, MRC Secretary Walter Fletcher found himself under pressure to break up the radium and to redistribute it to several centres around the country.[48] The voluntary hospitals were favoured as the location of the centres, because they were already equipped with both beds and laboratory facilities. The MRC encouraged the centres to create ad hoc hospital committees to oversee the operation of the centres, and a Radiology Committee was set up to administer the scheme. Sydney Russ, Professor of Physics at the Middlesex Hospital, became its Secretary, and Sir Cuthbert Wallace, consultant surgeon at London's St Thomas' Hospital, was appointed chairman.[49]

The scarcity of radium led the MRC's Radiology Committee to prioritize clinical research over experimental studies which did not promise immediate returns to clinicians. The purpose of the scheme was to work out standard methods for the treatment of those conditions in which radium was considered suitable. These were cancer of the breast, uterus, mouth, nose, larynx and oesophagus; rodent ulcer; sarcoma and lymphosarcoma. Pathologist J. C. Mottram, who had joined the London Radium Institute in 1919 to set up its research laboratory, was personally allocated a share of the radium to study the effects of exposure to radiation. Non-malignant conditions of the uterus and skin were studied at the beginning of the scheme, but by 1929 the investigation was limited exclusively to various cancerous diseases.

The first report of the Radiology Committee devoted considerable attention to the treatment of cervical cancer. The reports from the centres indicated that a variety of methods were in use, involving different dosages and schedules. Concerns that inadequate amounts of radiation had been used at some centres prompted the Radiology Committee to issue recommendations about dosage. Despite the Committee's best efforts, however, the research scheme failed to produce a standard technique for the treatment of cervical cancer.[50] When the MRC's report on the radium therapy of cancer of the cervix was published in 1926, the *Lancet* was moved to deplore 'the ceaseless sporadic attempts at variation and still further improvement of the methods of applying this new weapon': surely the time was ripe to persuade 'at least some' of those who were using radium to limit themselves 'to an extensive trial of some agreed standard technique in a series of cases'.[51] In its report for 1927–8, the MRC itself expressed disappointment about the slow pace of change in Britain: 'Men speak familiarly of the "Stockholm" or "Paris" methods but not yet of the London or Manchester or Glasgow methods. Why is this? If it be so, it becomes a matter of national concern to answer this question.'[52] The reference to the 'Paris method' was in recognition of the work carried out at the Curie Foundation, the centre established by pioneer radiotherapist Claudius Regaud in 1921. Researchers at the Foundation had developed a method of delivering radium therapy which had proved extremely effective in the treatment of cervical cancer. Britain, however, seemed to lag well behind France and Sweden.

The Case for Centralization

Members of the Radiology Committee drew one lesson from the operation of the MRC's scheme: it was a mistake to allow the voluntary hospitals to play a part in radium research. Radiologist Alfred Barclay claimed that the techniques and knowledge involved in radium therapy were so specialized that only a few centres could use the precious element to full advantage.[53] Gynaecologist Malcolm Donaldson favoured the establishment of specialist centres, staffed by experienced workers. In his view, the number of cases admitted to the general hospitals was not large enough to support a systematic radium research programme, and most of the cases were distributed among clinicians who had no interest in research anyway.[54]

Discussions about the form of organization radium research should adopt revealed tensions between practitioners who saw radium therapy as an extension of their existing repertoire, and those who perceived radiation as a new form of treatment of the cancer patient. The problem was usually framed in terms of effectiveness and expertise, but the underlying issue was one of control: who was to have jurisdiction over the cancer patient? Alfred Barclay thought that his profession should be in charge. Dismissing radium surgery as a 'comparatively simple matter', he argued that 'the expert who controls the treatment should be the man who has expert knowledge of the most potent weapons – i.e., radium and X rays'.[55] But it could also be argued that surgeon and radiologist were equal partners, since one could do in one sphere what the other could not do. As the *BMJ* commented in 1933, only a superficial onlooker could claim that radium surgery was a simple procedure, requiring no special qualifications. At the same time, radium surgery was only a means to an end, that is to say 'the efficient distribution of the radiations from the radio-active material in the containers'. This was a 'physical problem of no small complexity', demanding specialist skill and expertise: as the techniques of radiotherapy advanced, no surgeon or gynaecologist could hope to acquire the necessary know-how simply by attending a short course in radium surgery. There was thus a strong argument in favour of teamwork in the delivery of radium therapy: 'Co-ordination, co-operation, and permanency of specialist staff are certainly not least among the essential conditions for success', the journal observed.[56] The *Lancet* agreed that the development of radium surgery pointed to one conclusion: 'even in the new era the radiologist and surgeon must work together'. Taking the argument further, the journal argued for the unification of surgical and radiotherapeutic tasks: ‘most efficient of all will be the man who can combine surgical with radiological technique in his own repertory’.[57] As long as tasks remained separate, collaborative patterns of work would have to prevail.

Advocates for centralization of radium therapy regarded teamwork as an integral aspect of the work. As Cooter and Sturdy describe, ‘teamwork’ had become a buzzword in Britain during the First World War. In 1915 Alfred Keogh, the wartime director-general of the army medical service, had introduced the notion of ‘surgical teams’ consisting of a surgeon, an anaesthetist, a theatre sister and an operating theatre orderly. Wartime organizers, such as the pioneer of modern orthopaedics Robert Jones, emphasized the importance of rational, hierarchical teamwork as a means of promoting the efficiency of rehabilitation programmes for military personnel. After the war, Bertrand Dawson and other medical politicians adopted the notion of teamwork in their proposals for the reorganization of the peacetime medical service. Teamwork was seen as a means of correcting unorganized, ostensibly haphazard and inefficient medical arrangements, whether within single institutions, or between institutions and services spread over cities, regions or the country as a whole.[58] In medical research, the practice of interdisciplinary teamwork was celebrated as an antidote to fumbling individualistic effort.

One of the earliest examples of the centralized model of radiotherapy in England was the Marie Curie Hospital in London. This institution evolved from a radium research scheme established in 1924 by the London Committee of the MWF. The Federation was a feminist organization, founded in 1917 to represent the interests of women doctors (especially those serving in the armed forces) and women patients. It was particularly concerned with career opportunities and medical education for women. In the interwar years it demonstrated its strong commitment to women’s health by conducting surveys and research about the menopause, abortion and family planning. It championed instruction in birth control for women, and it advocated the reshaping of the gynaecological curriculum. Cervical cancer was another area of concern for women doctors, not only because it was a ‘woman’s disease’, but also because it raised issues of delicacy which female practitioners were seen to be uniquely placed to tackle. As Louisa Martindale remarked in 1922:

> it is essential in all diseases that treatment should be begun early, but in no disease is it of more importance, nor is it as a rule so long delayed, owing to

> the very natural dislike of the patient to medical examination. Much of her terror is allayed if she finds a Woman Doctor available, and if for the treatment of no other disease than this, the existence and work of the Woman Doctor is more than justified.[59]

In the mid-1920s, the radium treatment of cervical cancer, still then in its infancy, attracted women doctors' attention not only as justification for their role, but also as a means of advancing new aims: ascending career opportunities, and feminist aspirations to achieve equality with men.

The MWF's Radium Research Scheme

The central character in this story is pathologist Helen Chambers, the first full-time cancer researcher employed by the MRC at the Middlesex Hospital Cancer Research Laboratories.[60] A graduate of the Royal Free Hospital in London, Chambers had established her reputation in cancer research with a series of articles on the biological effects of radiation, published between 1911 and 1913 in collaboration with Sidney Russ, the Middlesex Hospital physicist and radium expert. During the war she had worked as a pathologist at the Endell Street Military Hospital, an institution founded in 1915 by militant suffragists Flora Murray and Louisa Garrett Anderson.[61] When the Endell Street Hospital closed after the war, she returned to work at the Middlesex with Professor Russ. In 1923 she was invited to join the Treatment Sub-Committee of the Ministry of Health's Cancer Committee, much to the surprise of Walter Fletcher who thought that Chambers was not qualified for the job.[62] The success of the Marie Curie Hospital, in which Chambers had a large share, suggests that Fletcher may have been too hasty in passing judgement.

In February 1924 Chambers gave a talk about 'Progress in the Cancer Problem' to the monthly meeting of the London Committee of the MWF. She emphasized the necessity of improving the treatment of cancer of the uterus, drawing attention to the value and shortage of radium. To make real progress in the treatment of cervical cancer, she argued, it was necessary that a large number of cases should be treated by the same technique. Her suggestion was that a body of medical women might be persuaded to cooperate in the study of one specific aspect of cancer therapy.[63] The result was that a Cancer Research Committee (CRC) was immediately formed, consisting of Chambers and four women surgeons already well known as feminists, suffragists and champions for women's health: Miss Maud Chadburn, founder of the South London Hospital for Women; Lady Grace Maud Briscoe, physician to the Shoreditch Maternity Centre; Lady Florence Barrett, consulting obstetric and gynaecological surgeon to the Royal Free Hospital; and Louisa Martindale, founder of the New Sussex Hospital for Women. Dr Kate Platt, an authority on medical work for women in India, was elected Secretary. Louise McIlroy, the first Professor of Obstetrics and Gynaecology at the Royal Free Hospital, and Miss E. Bolton, surgeon at the Elizabeth Garrett Anderson Hospital, later joined as co-opted members.[64]

As a first step, the committee decided to investigate the therapeutic efficacy of radium in the treatment of cervical cancer. Radium therapy was of interest to women doctors for three main reasons. First, the women's hospitals could provide a sufficient number of cases for meaningful comparisons to be made. Second, radium therapy had the potential to become an alternative to hysterectomy, an operation many women regarded as mutilating and 'unsexing'. Third, radiology and radium therapy could provide valuable employment opportunities for women doctors at a time when women still faced many difficulties in pursuing a career in medicine. In contrast to male-dominated areas like surgery, the new fields of radiology and radium therapy could accommodate female 'outsiders'; they were also areas where the demand for trained female practitioners was growing. As radiologist Mary Magill emphasized in 1925:

> the special hospitals, staffed entirely by women, need women radiologists to take charge of their X-ray departments; women practitioners look for women radiologists to whom they can send their patients; and women patients do, in the majority of cases, prefer that opaque meals and similar unpleasant procedures should be conducted by a woman. Those who, for any reason, temperamental or otherwise, feel that pure clinical work is not for them, may well consider the enormous possibilities offered by radiology and electro-therapeutics.[65]

The proposed research scheme received the blessing of the MRC's Radiology Committee, and from 1925 onwards it was included in its radium research programme. This did not please George Newman, who feared that another campaign may be starting.[66] Walter Fletcher agreed that this was undesirable, but he still thought that the project was deserving of support: 'these women are dealing with cancer in women, and in so far as this radium is concerned, chiefly with cancer of the womb … Of all the radium jobs, this seems the most appropriate for women to tackle, for obvious reasons.'[67] MRC backing for the scheme did not go as far as providing material support, however. The Council had no money for a research worker, and no radium for loan, as the original amount in its possession was already allocated to other centres. The MWF thus turned to the public for help.[68] The public appeal unfortunately did not raise enough funds, and it was eventually the BECC which provided both the money for a research officer, and the radium the MWF needed to initiate the scheme.[69]

In 1925 the MWF's Cancer Committee invited Dr Elizabeth Hurdon to become research officer of the project.[70] A graduate of Toronto University, English-born Hurdon had all the necessary qualifications by reason of her previous work in gynaecological surgery and gynaecological pathology. She had studied at the Johns Hopkins Hospital under Thomas Cullen, the pioneer of gynaecological pathology, and in 1898 the school had named her assistant professor of gynaecology. When the American College of Surgeons was created in 1913, Hurdon had been one of a dozen women elected to the fellowship. In 1915 she had volunteered for service in the Royal Army Medical Corps, spending the next six years at various military hospitals in Malta, Salonika and London. Family affairs had eventually forced her to settle in England. Hurdon had struggled to find a hospital appointment, but she had eventually secured a temporary post as lecturer in pathology at the University of Liverpool. It seems that during this time she had become interested in the therapeutic use of X-rays and radium. In a letter to Cullen she described preparing a book on the subject. She wanted to use some material from Hopkins and perhaps collaborate with Burnam and Kelly.[71]

Hurdon's first step as research officer was to undertake a detailed survey of the literature. She then set off on a tour of hospitals and radium centres in Europe to learn as much as possible about the methods in use. The most successful techniques were those developed by Regaud in Paris and by Heyman in Stockholm. Regaud advocated continuous radiation at low intensity; Heyman used doses of relatively high intensity, delivered in two or three applications.[72] Hurdon adopted the Stockholm method, but she modified it to ensure that the cone of radiation would be as wide as possible.[73] As in Stockholm, three treatments were given, each of twenty-two hours, the second a week after the first, and the third two weeks after the second. Participating clinicians agreed to adopt the recommended treatment plan and to carry it out as advised in each case. Hurdon transported the radium to the four hospitals in turn, provided advice about dosage, attended the insertion of the radium, compiled records and followed up each case. The histological part of the work was carried out by Helen Chambers. Treatment initially focused on the inoperable cases. The first patient, an elderly woman with late stage cervical carcinoma, was treated by Louisa Martindale at the New Sussex Hospital in September 1925.

As the number of patients increased, it became apparent that the work needed reorganization. Sharing out the radium among the four hospitals generated inefficiencies, first because valuable time was lost transporting the element from one hospital to another, and second because the radium could not be used continuously.[74] The other problem was that following up cases was difficult without a central out-patient department. The CRC thus felt justified in making a special effort to establish a central hospital. Helen Chambers welcomed the move as a sign that radium therapy had come of age. Writing in 1930, she observed that by the late 1920s 'it was generally recognised that Radium therapy was a highly specialised field of work which should only be undertaken at a Centre designed and equipped for the purpose. No one should use Radium who had not had special training. It was realised that the success of the treatment depended entirely upon careful dosage and technique … and that the co-ordination of an organised team was essential.'[75]

The Marie Curie Hospital

Money for the new venture was raised through newspaper appeals and charity events.[76] Leading medical commentators urged support for the new venture. The *Lancet* emphasized that women suffering from gynaecological complaints were frequently referred to female practitioners because they were reluctant to consult male doctors: 'This fact, and the efforts being made to conduct the investigation by medical women into the therapeutic scope of radium on scientific lines, should secure an adequate response to the appeal being made for funds to prosecute and develop the work.'[77]

The MWF's initiative was also championed, more controversially, by Doctor Caleb Saleeby, a Fabian Socialist and friend of George Bernard Shaw. Saleeby was a regular contributor to the *New Statesman*, the Fabian Socialist weekly founded in 1912 by Sidney and Beatrice Webb. Writing under the pseudonym 'Lens', he vigorously promoted various causes, from heliotherapy to temperance reform. In March 1929, the news that a hospital for radium therapy, to be named the Marie Curie Hospital, was about to open in London, prompted Saleeby to attack the 'monstrously selfish, arrogant, obstructive and anti-social record of the surgeons in this country as a body in respect of the radiation of cancer'. Saleeby asserted that 'wherever radium is available, the ghastly and deadly operation of panhysterectomy should be condemned as malpraxis'.[78] He was thus pleased to report that the women of the Marie Curie were planning to extend their investigation to the treatment of breast cancer, an approach advocated in Britain by surgeon Geoffrey Keynes: 'Let us rejoice that, at last, after thousands of years, mankind may begin to say, *Exit* the surgery of cancer.'[79]

As a woman's cause, the proposed hospital drew strong support from feminist sympathizers. The list of subscribers included Margaret Bondfield, the Labour MP; Lady Rhondda, proprietor of the liberal feminist paper *Time and Tide*; and Millicent Fawcett, former President of the National Union of Women's Suffrage and younger sister of Elizabeth Garrett Anderson. Also represented were campaigners for women's welfare like Eleanor Rathbone, the Family Allowance pioneer, and women doctors themselves: the largest donation (£10,000) came from Dr Elizabeth Courtauld, a distant relative of textiles manufacturer Samuel Courtauld.[80]

By the end of 1928 the CRC had collected enough money to purchase a large mansion in London's Hampstead district. Miss Elizabeth Scott, the architect of the Shakespeare Memorial Theatre at Stratford, was appointed to do the conversion work. The Committee felt especially privileged that Madame Curie had allowed her name to be given to the new institution.[81] The Marie Curie Hospital opened to patients on 16 September 1929. It had thirty beds, both private and public; an operating theatre; a pathological laboratory; and a diagnostic and follow-up clinic for out-patients. A team of seventeen surgeons, five physicians, a pathologist and a radiologist carried out the work under the direction of Elizabeth Hurdon. The research was supervised by a 'scientific advisory council' that included Walter Fletcher and three members of the MRC's Radiology Committee: Sidney Russ, Sir Cuthbert Wallace and Professor E. H. Kettle (pathologist).

The association of the hospital with the discoverer of radium placed the doctors of the Marie Curie on a high moral plane. Marie Curie was a feminist icon, revered by women the world over for her many contributions to a sphere traditionally dominated by men. The women of the Marie Curie were the bearers of the torch. As the Archbishop of Canterbury reportedly said at a meeting held in aid of the hospital in 1936, Marie Curie had 'opened a light of hope on the darkness, and the devoted women whom they were now being asked to help were following her path'.[82] Eve Curie, the second daughter of Pierre and Marie Curie, described the Marie Curie Hospital as 'a beautiful and generous work'.[83] Speaking at a fund-raising banquet held in March 1935, just months after her mother's death, she revealed that the creation of hospitals like the Marie Curie had been one of Marie's greatest dreams. In the 'simple name' of the hospital, Eve perceived the 'epilogue of a fairy tale' which had started when her mother had arrived in Paris as a poor, twenty-four-year-old Polish student: 'I am happy and grateful to think that it is in England, in a great country which my mother admired and loved, that the dream of hers has been realized.'[84]

The publicity material issued by the hospital in the interwar period capitalized both on women's dislike of male gynaecologists, and on popular fears of experimental surgery. Feminist novelist and poet Vita Sackville-West wrote that the Marie Curie existed to minister to those 'peculiarly feminine ailments' which women were notoriously reluctant to discuss with a male doctor. But if a woman knew that she could go to a hospital

> where she meets with nothing but the 'indefinable freemasonry of sex'; meets only other women who, though doctors, are speaking the same intimate language as herself; women to whom no revelation is novel, even the most secret fears and shyness and atavistic complexes – then her reluctance [to seek medical advice] may be modified and the danger taken before it is too late.[85]

Lower class women, she added, dreaded hospitals because they were afraid that they might be subjected to experimental surgery. The application of radium raised no such fears: women were more willing to deliver themselves over to the care of the Marie Curie because they knew that their poor bodies would not be ‘carved up while they lay under the arc-lights unconscious and without defence’.[86]

By 1929 the women of the Marie Curie had treated 322 cases, of which only 68 were operable.[87] The CRC had adopted the five-year surgical ‘cure’ as the standard of successful treatment, so it was still too early to make definite claims about the efficacy of the therapy. The results were described as ‘encouraging’, however. Chambers reported that 90 per cent of the operable cases were free from all signs of cancer, while all the inoperable cases were ‘materially benefited’.[88] Most of the deaths were attributed to ‘asthenia due to internal metastases’; only one death had occurred as a direct result of the treatment. Maud Chadburn, the chairman of the CRC, was overjoyed: ‘To anyone like myself who considered radical operation gave the only promise of cure these results seem like conjuring’, she remarked. ‘The fact that there is a promising treatment without the dreaded operation, that something can now be done for inoperable cases, and that our surgeons are being converted by our four years’ experience, have all led to rapidly increasing numbers of patients applying for treatment.’[89]

It was not long before the MWF surgeons, impressed by the good results, began to refer operable cases. By 1934 the Marie Curie had treated 997 patients at various stages of the disease. The five-year survival rate in the early cases was 83 per cent as compared with an average of 50 per cent at the other centres in the MRC scheme. For the more advanced stages, the other institutions reported a 27 per cent ‘cure’ rate, and the Marie Curie 40 per cent. These results were so good that they prompted tributes from prominent politicians, lay commentators and distinguished male physicians, including Lord Dawson of Penn and Henri Coutard, the well known French radiotherapist.[90]

By the outbreak of the Second World War the hospital was treating some 700 patients annually in 39 beds. The initial investigation into the use of radium for carcinoma of the cervix had been extended to the treatment of inoperable cancer of the breast and a few cases of advanced carcinoma of the rectum. Facilities for X-ray therapy were added in 1933, and in 1937 a new building housing research laboratories, hostel accommodation for out-of-town patients and a nurses’ wing was opened by Queen Mary, who had been patron of the hospital since its foundation (Figs. 5.1 and 5.2).

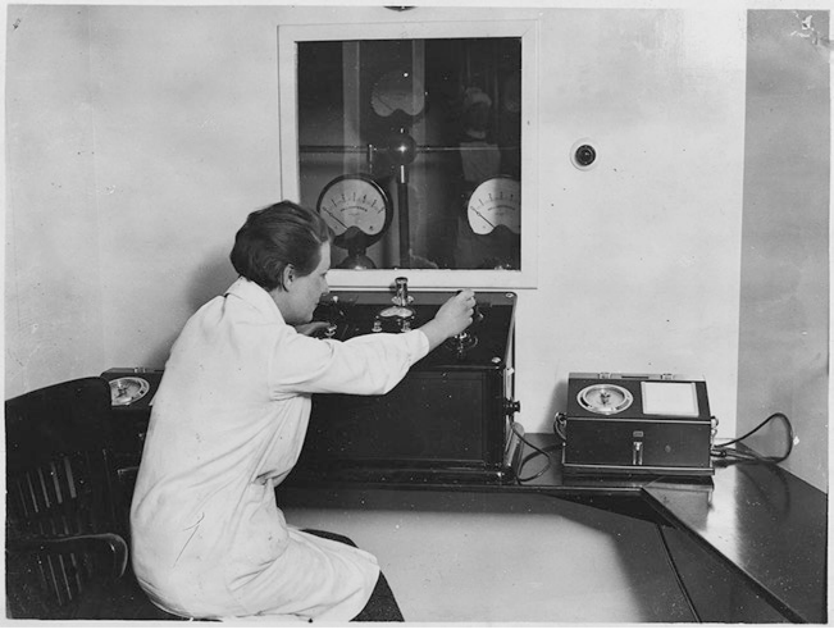

Fig. 5.1 Control panel for X-rays, Marie Curie Hospital, 1934 (Photographers: Newton & Wright. Courtesy of the Medical Women's Federation)

Why were the doctors of the Marie Curie proving so much more successful than male colleagues? The question was asked by Lord Horder, the eminent physician, at a fund-raising event hosted in 1934 by Prime Minister Ramsay MacDonald. Lord Horder conceded that there were spheres in medicine, particularly in therapeutics, in which women showed an exceptional bent. Radium therapy was one of them: 'whether it was that women were more painstaking, or were more accustomed to attention to detail as part of their daily routine', he reportedly said,

> the fact remained that in this particular branch of treatment they did excel, and there was definite evidence that they got their results, not by the application of different principles from others, but by the more careful application of the same principles.[91]

The women of the Marie Curie agreed that attention to detail, meticulous application of technique, and strict asepsis were important, but they drew

Fig. 5.2 Mme Curie's legacy: Queen Mary visits the Marie Curie Hospital accompanied by Eve Curie, Henri Coutard and Viscountess Runciman, 1937 (Photographers: Valentine. Courtesy of the Medical Women's Federation)

particular attention to the organization of radium therapy at the Marie Curie. According to Louisa Martindale:

> the success in treatment was apparently due to team work and perhaps superior asepsis. The application of the radium was made by the surgeon herself, the technique was controlled by the pathologist, and the screen and measuring of the dosage by the physicist, the director examining every patient and being present at a great number of the treatments. The follow-up was regularly done, and the nursing was carefully supervised.[92]

Mary Chadburn emphasized that teamwork was 'the only way to make the results of any good from the statistical and research points of view, and the only way to acquire the most perfect technique and to discover the best treatment for the patient'.[93] This pattern of collaborative work was more typical of the cancer research and treatment centres established in the Paris region during the 1920s. In these institutions, pathologists, diagnostic radiologists, radiotherapists and surgeons were all experts on cancer and its treatment, and surgery and radiotherapy were treated as equal options. Both Pinell and Close-Koenig have drawn attention to the influence of non-surgeons on the development of the centres found in France.[94] Close-Koenig argues that the proximity of pathologists to cancer centres shaped the practice of radiotherapy. Where pathologists were important team members, the information gathered in the laboratory served to tweak treatment regimes and guide the choice of therapy. It is thus no doubt significant in the Marie Curie Hospital case that Chambers was a pathologist, and that Hurdon had expertise in both gynaecological pathology and surgery. There may have been another factor. Pinell has shown that the teamwork approach in France was strongly supported by the network of those who had participated in multi-disciplinary medical war units.[95] Wartime experiences may have been relevant in the case of the Marie Curie Hospital too. Hurdon had served as a doctor in the RAMC; Chambers had worked as a pathologist at the Endell Street Military Hospital. Founder Flora Murray had pleasant memories of her interactions with colleagues there: 'In civil hospitals members of the staff may not meet for weeks at a time', she observed in her memoirs:

> but in a military hospitals surgeons and physicians attended daily, and at the morning meeting the orderly officer's report for the previous night was read, and it was possible to talk over the various cases. A lot of good team work was done, the surgeons, physician and pathologist concentrating on the worst cases. The pathological laboratory … was the scene of many useful consultations.[96]

Lessons learnt in the war may well have proved useful in peacetime, when feminist doctors returned to civilian practice.

SCALPEL OR RAYS? THE STATISTICAL DEBATE

As we have seen so far, in the first two decades of the twentieth century radium therapy found a place in gynaecology as 'handmaiden to surgery'. Practitioners took to it because it extended the reach of surgery into otherwise inoperable conditions, and because it promised to improve the effectiveness of surgical intervention. During the early 1920s the status of radium therapy began to change. There was much evidence that treatment by radium could be as effective as surgery in cases of operable cervical cancer. As the primary mortality was significantly lower than the mortality of radical abdominal hysterectomy, the argument for abandoning surgery in favour of radium therapy was becoming increasingly compelling. Most of the evidence was published in foreign journals, however: Britain had yet to produce extensive statistics of radium therapy.

In the late 1920s the paucity of British statistics became a matter of concern for the Cancer Committee of the Ministry of Health, as it suggested that practitioners were either failing to report series of cases, or missing the opportunity to use the rays as widely and as successfully as on the Continent.[97] From the Ministry's point of view, radium therapy had several advantages over surgery. First, it could serve to extend the economic usefulness of sufferers, particularly those affected by inoperable disease. Second, as radium treatment required a shorter hospital stay than surgery (twenty days as opposed to six weeks in the case of the Christie Cancer Hospital in Manchester), more people could be treated.[98] Shorter hospital stays also meant that mothers of families and people in paid employment could be returned more speedily to their usual occupations. Third, the availability of an alternative to mutilating surgery might encourage potential sufferers to seek medical advice early, thus increasing the chances of cure. This was a particularly important point in the development of a strategy for the prevention of cervical cancer mortality, as Sir George Buchanan, the Senior Medical Officer at the Ministry of Health, pointed out in 1928: ‘it seems probable that, with wider use of a method of treatment less repugnant to most women than operation, one of the probable reasons for delay in seeking treatment may be eliminated and opportunities for securing a larger proportion of survival improved’.[99]

In an effort to promote radium and X-rays among practitioners, in 1926 the Cancer Committee commissioned physician and public health official Janet Lane-Claypon to carry out a series of surveys on the efficacy of surgery and radium therapy for cancer. Already noted for pioneering work in epidemiology, Lane-Claypon was to play an important part in the development of the League of Nations Health Organization's staging system for cervical cancer, introduced by the Organization's Radiological

Subcommission in 1928. The reports she published on the results of cancer treatment were recognized everywhere as standard reference works in the field.[100]

Lane-Claypon's first report focused on the results of treatment for cancer of the uterus.[101] Based on a meticulous analysis of the (mostly foreign) literature, it compared the results of radical surgery with those of radium therapy alone, and radium and X-ray therapy combined. Its main conclusion, widely reported in the medical press, was that surgery was better than radiation in cases of operable cancer of the body of the uterus. Cases of operable cancer of the cervix had marginally better five-year survival rates if treated by surgery, but the operative mortality was 17.3 per cent. If the inoperable cases were included, radiation gave the better results, and the mortality from the treatment was only 2 per cent.[102]

Lane-Claypon's report stimulated further debate and discussion. At the International Conference on Cancer, held in July 1928 in London under the auspices of the BECC, an entire panel was devoted to the subject. Both radium and X-ray therapy were said to have made great strides in the fields of throat and buccal cancer, but the new importance of rays was attributed primarily to advances made in the treatment of cervical malignancies. Speaking at the BECC conference, Donaldson remarked on the astonishingly rapid rate of change in the treatment of the disease: 'How many people are there in this room who would have thought even so short a time ago as 10 years, that there would be to-day a serious discussion as to whether the first line of treatment of carcinoma of the cervix should be radiotherapy or hysterectomy?'[103] Carcinoma of the cervix, he asserted in 1930, was the 'birthplace of radio-therapy'.[104]

After the London Conference, reports in the lay press served to generate a new wave of enthusiasm for radium. Radium therapy, which had received relatively little support before the war, became a new focus for fund-raising. Otto Beit, the well-known financier and philanthropist, donated £50,000 to the King Edward's Hospital Fund for London for the purchase of radium, and in 1929 a Thank-offering campaign, launched to celebrate the king's recovery from near-fatal blood poisoning, raised £37,000 for further purchases of radium.[105] The new importance of radium therapy prompted radiologist Alfred Barclay to talk of a 'boom in radium', with gynaecologists and surgeons leading the stampede.[106]

Not all gynaecologists succumbed to the radium craze, however. Gynaecologists William Fletcher Shaw and Victor Bonney strongly criticized the suggestion that radium should be used in operable cases, citing the lack of British statistics of radium therapy as a reason for continuing with the radical operation. In a letter to the *BMJ*, published in 1927, Shaw wrote: 'When statistics are published in this country showing that cases of carcinoma of the cervix treated by radium have as high a percentage of non-recurrence after five or ten years as have those treated by Wertheim's hysterectomy, I will most gladly abandon this operation, which until then I feel compelled to advise and perform.'[107] Bonney likewise deprecated

> as altogether premature the appeals that have been made to the younger generations of surgeons not to embark on the operative treatment of cancer of the cervix, but instead to take up radium therapy, the present estimate of whose value in this connexion is founded solely on figures from abroad. Not until the results of reliable workers in this country are available shall we be in a position to properly appraise its effects, for it does not follow that the same measure of success attending a method of treatment in one country is necessarily attained when it is carried out in another country.[108]

The statistical question was in fact far more complex than these remarks might suggest. Comparison of results made sense only if the cases treated by the surgeon and by the radiotherapist were similar. This was not the case, however. Surgeons only treated the cases they deemed operable, but radiotherapists treated both operable and inoperable patients. Furthermore, as observed elsewhere in this work, there was no uniform standard of operability. Figures varied not only from surgeon to surgeon, but also from district to district, and from year to year.[109] As London surgeon and radium therapy advocate Sidney Forsdike observed in 1927, there was indeed a case for arguing that surgeons and radiotherapists had no statistics in common, until surgeons could show that their operability rates equalled treatment rates by radium.[110]

During the 1920s the demand for common categories prompted some experts to suggest that subjective evaluations of 'operability' should be abandoned in favour of uniform definitions of primary cervical malignancy, based on objective criteria accepted by all. But the standardization of the clinical phenomena under treatment proved very difficult in practice, partly because cervical cancer was not the 'same' disease for the radiotherapist and for the surgeon.

Comparing Treatment Outcomes: The Origins of the ‘Staging’ Concept

The early 1920s laid the groundwork for a number of schemes, which used the anatomical spread of cervical cancer as the basis for classification. German-born Henry Schmitz, Professor of Obstetrics and Gynecology at Loyola University in Chicago, was the first to suggest a system designed to mimic the ‘natural history’ of the disease.[111] Schmitz proposed to divide the malignancies of the cervix into four groups representing the progressive growth of the tumour. In Group P1 the malignancy was localized within the cervix and it did not exceed one centimetre in diameter. Group P2 indicated a growth that had extended to the periphery of the cervix in a longitudinal or transversal direction. The uterus was less mobile owing to the decreased elasticity of the paracervical tissues. Group P3 meant that either one or both parametria or the regional lymph nodes had been invaded. Group P4 included tumours with absolute fixation of the uterus.[112]

Schmitz’s classification proved popular in the United States. It was in use at the Mayo Clinic from 1923, and after that it was rapidly accepted at a number of other centres.[113] In the meantime the classification of cervical cancer had become a subject of frequent discussion at the meetings of the German Gynaecological Society. At the Society’s Heidelberg Congress in 1923, Winter, Döderlein and others proposed a new scheme which classified cervical tumours into four groups (operable, borderline, inoperable and hopeless) according to the extent of the growth and the mobility of the uterus.[114] The problem with this system was that it was still based on criteria of ‘operability’. As pointed out earlier, these differed between surgeons, and they were not applicable to radiotherapy.

In 1928 the Cancer Commission of the League of Nations set up a Radiological Subcommission to investigate the radium therapy of cancer, with special reference to cancer of the uterus.[115] One of the purposes of the Subcommission was to collate statistical data on the results of treatment. The desire for uniform statistics led to the formation of a small ‘classification committee’ consisting of epidemiologist Janet Lane-Claypon, physicist Friedrich Voltz, and radiation expert Antoine Lacassagne. Under the chairmanship of James Heyman, the committee produced a system to enable inter-institutional comparison of results. The scheme, later known as the League of Nations Classification for Cervical Cancer, maintained the four-group subdivision common to other classification systems, but it avoided using subjective criteria of 'operability' as the differentiating characteristic. It allocated cases to four different groups, based on the anatomical spread of the growth, and the mobility of the uterus.[116] Members of the committee were guided by four main considerations. First, the definitions of the different stage-groups should be as simple and precise as possible. Second, the rules for allocating cases should be easily interpreted. Third, one stage should be sufficiently differentiated from the other by characteristics easily recognized on clinical examination. Fourth, each group should contain a number of cases large enough to be of statistical value.

One of the problems with inter-institutional comparisons was that many clinics did not receive random, unselected samples of patients. This meant that assessing results in terms of 'overall' cure rates (that is to say, the proportion of 'cured' patients as a percentage of either (a) the total number examined with a view to treatment, whether they are treated or not; or (b) the total number actually treated) might produce a misleading picture of the efficacy of different therapies. The committee thus decided to use 'stage-rates', defined as the percentage of women with a certain stage of carcinoma who were still alive five years after treatment.[117]

Members of the Radiological Subcommission hoped that their classification system would meet with international agreement, but its acceptance and widespread use were slow to materialize. The main problem in the early 1930s was that most of the North American clinics were reluctant to give up the Schmitz system. Efforts to publicize the League of Nations' scheme resulted in the publication of an annual report, presenting overall five-year survival rates by stage.[118] The first Annual Report was published in 1937 with Heyman as Editor in Chief (he was to fill this role until 1956, when he was succeeded by his former pupil and close friend Hans-Ludwig Kottmeier). Six participating European centres had agreed to supply the data: the Centre for Tumours at Brussels University; the Liverpool Radium Institute; the Marie Curie Hospital in London; the Radium Centre for Carcinoma of the Uterus of the London County Council; the Paris Radium Institute; and the Radiumhemmet. The release of the first report was followed by the publication of an *Atlas* illustrating the division of cervical cancer into four stages. Written by Heyman in collaboration with M. Strandquist, the *Atlas* was styled as a vademecum that the busy practitioner could carry in his or her pocket for quick reference. It contained definitions, staging diagrams and descriptive text in English, French and German.[119]

In *A Woman's Disease: the History of Cervical Cancer*, historian Ilana Löwy writes that 'thanks to the introduction of a uniform system of classification of cervical cancers, doctors were able to compare the results of treatments of this disease'.[120] In reality this comparative analysis remained problematic, because the data gathered were not recorded in a uniform manner. Despite the classification committee's best efforts, inconsistencies in the staging process were apparent by the mid-1930s. These were partly due to the fact that the notion of 'uterine mobility', used to define the different stages, was too vague to serve as a criterion for classification. The other problem was that clinicians used different procedures to evaluate cases. Some investigators assessed the results on the basis of the clinical stage of the disease at the first full examination; others corrected the stage when the findings at operation or necropsy showed the clinical assessment to have been incorrect. The latter approach was favoured by surgeons, who argued that it was not possible to ascertain lymphatic gland involvement (and hence the stage of the disease) by clinical examination alone. The idea of restaging after surgery may seem more rational, but it prevented a fair comparison of treatment modalities because the patients who underwent surgery were not assessed in the same way as those who received radium therapy.[121]

In order to ensure greater accuracy and uniformity of grading, changes to the wording and definitions for the various stages of cervical cancer were made in 1937. In the revised system clinicians were instructed to stage a malignancy without reference to the degree of uterine fixation. They were also required to determine the extent of disease at examination, before any therapy could affect the tumour.[122]

In 1950, at the New York World Congress of the International Federation of Gynecology and Obstetrics (FIGO), further changes were applied to the 1937 classification. The most controversial of these was the introduction of Stage 0 carcinoma to designate abnormal non-invasive lesions (defined by some as 'latent' pre-invasive cancer). The modified staging system was nominated 'the International Classification of the Stages of Carcinoma of the Uterine Cervix', and all the organizations concerned with the problem of cervical cancer were invited to adopt the scheme. Data from other gynaecological sites were gradually added during the 1960s and 1970s.[123] In 1958 FIGO became the official patron of the Annual Report, but the collection and publication of the data remained dependent on the generous support of a number of international cancer organizations, especially the Radiumhemmet.

Two more staging systems emerged after the end of the Second World War. The French Permanent Cancer Survey, which organized the recording of tumours in France from 1943 onwards, introduced a new classification based on the spread of the disease from the initial tumour (T), to the lymph nodes (N) and finally to other organs through the process of metastasis (M).[124] At the end of the 1950s this TNM system was adopted by the Union for International Cancer Control (UICC) and it is now the most widely used in the field of cancer. In the United States, the American Joint Committee on Cancer (AJCC) created its own system at about the same time. Evolving in parallel, the two systems contained significant differences, but in the early 1980s they were gradually unified.

Both FIGO and TNM systems are now used for staging of gynaecological tumours, but there are substantial differences with regard to their objectives, methods of staging used, and separate classification of components. The TNM classification is based on a dual system distinguishing between clinical (pre-treatment) classification and a pathological (post-surgical histopathological) staging. Like the FIGO system it aims to provide inter-institutional comparisons of patients and treatments, but in addition it has further objectives: help for planning therapy; estimation of prognosis; and quality assurance of clinical classification. The FIGO system on the other hand aims primarily at providing inter-institutional comparisons, and it only allows a single staging. It is now either a surgical or pathological staging in most sites, with the exception of cervical cancer, and cancer of the vagina, which are still staged by clinical methods: this means that lymph node status is not included.[125] The main reason given now for maintaining a clinical staging for cervical cancer is that the vast majority of cases are seen in developing countries, where many of the diagnostic and investigatory techniques used in the developed world are not readily available. As the FIGO system aims to be a universal system, the use of a clinical staging system is considered to be more appropriate for cervical cancer.[126] Different considerations apply to cancer of the vagina. Surgery has a limited role here partly because of the proximity of the bladder and rectum, partly because many cases present with disease beyond the vagina. Surgico-pathological staging is thus regarded as inappropriate in this type of cancer.[127]

Decades of debate and discussion have brought clinicians no closer to the goal which the original staging systems were meant to achieve, however. During the 1950s, the addition of Stage 0 carcinoma and the gradual introduction of programmes combining radiotherapy with surgery and/or chemotherapy shook the simple plan of reporting end-results, introducing statistical pitfalls that made comparison of results extremely difficult. By the early twenty-first century, gynaecologists were acknowledging defeat: 'Experience accumulated over decades has shown that a more precise answer to the question of superiority of one to the two treatment modalities we have today will not be found', the Argentinian gynaecologist Guillermo di Paola commented in 2001: 'This means that in the future, staging has other purposes and this may lead to alterations in concept and in detail.'[128]

Cancer in Women: Radium Therapy for the London Poor

Despite the scarcity of British statistics, and the difficulties inherent in the production of reliable data, by the late 1920s an increasing number of practitioners accepted that radium therapy was better than the knife in cases of cervical cancer. The view in the lay press was that radium had proved so certain a remedy against cancer that the only reason for continuing with surgical treatment was the shortage of radium supplies and the determination of surgeons to retain a lucrative source of income.[129]

Health officials had anticipated that Lane-Claypon's reports would stimulate demand for radium. In late 1927, they began to flesh out plans to improve treatment provision for cancer sufferers. The first proposals, submitted in late 1927, focused on the establishment of a centre in London under the Poor Law.[130] The centre was to be equipped for surgery, radiology, pathology and clinical laboratory investigations, with a special section for gynaecological cases. Health officials reckoned that one thousand beds would be sufficient to treat the entire London population. The problem with the proposed scheme was that none of the Poor Law hospitals under the jurisdiction of the Metropolitan Asylums Board (MAB) was large enough to accommodate the required number of beds. Furthermore, the establishment of a publicly funded cancer centre raised delicate questions about its place within London's healthcare system.

A request from gynaecologist Comyns Berkeley prompted health officials to modify the original plan and establish a centre for the radium treatment of cervical cancer. As we saw in Chap. 3, Berkeley was one of the gynaecological surgeons who had helped establish Wertheim's hysterectomy in Britain. Sometime in the 1910s he had begun to try out radium on some of his inoperable cases, but he had given up in the face of unsatisfactory results. Then in the early 1920s, at Heyman's urging, he had begun to use the Stockholm method (Heyman thought that Berkeley had not been using the 'proper' method). By 1927 Berkeley had treated thirty-six advanced cases by the Stockholm method, with encouraging results.[131] A member of the MRC radium research scheme, Berkeley was keen to extend the work, but he did not have enough beds at the Middlesex. He thus tried to persuade the Ministry of Health to allow him to use some of the vacant beds in London's Poor Law Institutions. Berkeley offered to travel to six Poor Law infirmaries, and treat patients free of charge. As he could not use the Middlesex Hospital radium, he suggested that a small company should be set up for the purchase of radium. The company would also rent out radium or emanation at a rate that would yield 5 per cent interest.

Health officials were interested in Berkeley's proposals, partly because they thought that a 'radium' centre would be easier to justify than a 'cancer' centre. They were considerably less enthusiastic about the proposed private company, though, not least because they feared that renting out the radium would lead to uncontrolled use of a hazardous substance.[132] It was thus agreed that the radium required for the new radium centre would be purchased with public funds.

Concerns about efficient use of both radium and Berkeley's time prompted health officials to centralize treatment facilities. In 1928 the Metropolitan Asylums (Cancer) Order made the MAB responsible for the treatment of poor women suffering from uterine cancer and the North Western Hospital, an institution for smallpox and fever cases in London's Hampstead district, was chosen as the location for a unit with eight beds. In a circular sent out to all the London Boards of Guardians, the Minister of Health asserted that

> the value of radiological treatment of cancer of the uterus must be regarded as fully established. It has been used for many years at a number of large clinics on the Continent and in America, with excellent results … The results for 'early' and 'borderline' cases are similar to those obtained by surgery, while 15 per cent of those in whom the disease is stated to be inoperable have been found to be alive and well at the end of five years.[133]

Speaking at the International Conference on Cancer in 1928, Sir George Buchanan claimed that radium therapy's potential to reduce delay in the treatment of cervical cancer brought the subject 'more closely into the sphere of "public action"'.[134] What he meant by this was that radiological treatment required a greater degree of 'organized centralization' to maximize its efficacy: 'one only has to consider the cost and special nature of radium, the complexity and delicacy of deep X-ray apparatus, and the specialised skill needed for its application'.[135]

In March 1929 a second municipal radium centre for cancer of the skin, mouth and tongue was established at Lambeth Hospital, where surgeon George Stebbing was developing both X-ray and radium therapy.[136] When the Local Government Act was passed in 1929, the MAB's responsibilities were handed over to the London County Council (LCC). The LCC sought to create an integrated hospital service for London, concentrating certain specialized departments in particular hospitals.[137] The development of the radiotherapy department was encouraged at the Lambeth Hospital, and Stebbing was appointed Surgeon specialist and Medical Officer to the department. The unit at the North Western was then transferred to the Lambeth, with its director Comyns Berkeley and gynaecologist Arnold Walker. In the late 1930s Berkeley's unit was absorbed into the radiotherapy department of the Lambeth Hospital.

Both Berkeley and Stebbing played important roles in the establishment of a centralized system for the purchase and distribution of radium: the National Radium Trust (NRT) and the National Radium Commission (NRC). Berkeley was appointed vice-chairman of the NRC when it was formed in 1929. Stebbing served as its honorary medical secretary from 1929 until his death in 1947. Scholars have argued that the establishment of the NRC had a major influence on the development of British radiotherapy. The Commission encouraged the separation of X-ray therapy and X-ray diagnosis, and the merger of radium and X-ray therapy, which had hitherto been separate specialties. It also oversaw the training of radiotherapists. By the late 1930s it was quite clear that the days when surgeons could enter radium practice on a part-time basis were numbered: as the NRC's report for 1938 observed, 'radium treatment to be effective needs in the first place to be in the hands of experts who devote the whole of their time to radiotherapy; it is in no sense a "side line" or a mere casual adjunct to surgery'.[138] The trend towards specialization was hastened by the increasing use of deep X-ray therapy and the development of high beam therapies, which were only available at the radiotherapy centres.

During the early 1930s radiotherapy achieved a position of dominance in the treatment of cervical cancer. Visitors to Vienna reported that 'the shadow of the wings of Wertheim' had practically disappeared from the wards of the Vienna clinics: in all the large hospitals of the Austrian capital, radium therapy had completely replaced operation in cases of cervical cancer. By 1936 even Fletcher Shaw and his colleague Daniel Dougal in Manchester had given up the Wertheim, after trying out the technique recommended by the women of the Marie Curie. In a discussion of the results, Shaw and Dougal concluded that gynaecologists ought to employ the best method at their disposal: that method was 'the application of radium, and not the severe surgical procedure still favoured by many gynaecologists in this country'.[139]

Another Sort of Cumulation: Radiotherapy with Surgery

Just when radiotherapy appeared to have secured an unassailable lead over surgery, the first murmurs of discontent began to rise from the ranks of surgeons. In 1938 Australian-born ear-and-nose specialist E. R. Garnett Passe drew attention to the reports of the National Radium Trust and Commission, claiming that the results for certain carcinomas showed regression, rather than advance. Yet the general public had been given the impression that all that was necessary to combat the ravages of malignant disease was a sufficient supply of radium. According to Passe, brilliant results which had been obtained by other methods were overlooked, and surgery had been driven into the background: 'Is this fair to the surgeon or, what is much more important, to the patient?', he asked.[140] Obstetricians/gynaecologists also had reason to be unhappy, as the process of specialization of radiotherapy threatened to remove the cancer patient from their jurisdiction.

One of the first to appreciate the dangers of specialization of radiotherapy was Malcolm Donaldson, the radium therapy pioneer. At a meeting of the RCOG in October 1949, Donaldson warned that gynaecologists risked ceding control of their cancer cases to the radiotherapist.[141] Radiotherapy specialists were gaining ground thanks to two separate trends: GPs increasingly referring patients direct to the radiotherapist, and gynaecologists referring cases because they had no facilities for radiotherapy. The NRC had always insisted on joint consultations at its national radium centres. After the establishment of the National Health service (NHS) in 1948, the practice gradually spread throughout Britain: in 1956, for example, the Royal Cancer Hospital in London instituted a combined clinic which served nineteen referring hospitals.[142] The Cancer Committee of the Ministry of Health recommended that all gynaecological patients be seen by the gynaecologist and by the radiotherapist together. The RCOG was not happy with this advice, however. The College insisted that all cases of suspected carcinoma of the uterus should be seen by the gynaecologist first.[143]

In 1954 the RCOG reiterated this recommendation in a memorandum on the treatment of gynaecological cancer. The College recognized that radiotherapists had built an efficient organization for treatment and follow-up of cancer patients, but it was concerned that they were now the practitioners who decided whether a patient should be treated by surgery or by radiotherapy. RCOG leaders did not wish to advocate surgical rather than radiotherapeutic treatment, but they were concerned about the marginalization of gynaecologists in cancer therapy and the consequences this might have for teaching and training. The College thus made two main recommendations. Patients should be referred to gynaecological out-patient departments for diagnosis. If radiotherapy was indicated, the management of the case should be the joint responsibility of gynaecologist and radiotherapist.[144]

For some gynaecologists, cooperation was best expressed through a new approach: combined therapy. During the late 1930s disputes over the radiotherapy of cervical cancer were largely limited to technical questions of biology and physics and the relative merits of different methods of radiotherapy. After the war, the debate shifted again onto the value of radiation as compared with surgery. A number of gynaecologists began to question whether the results of radiotherapy justified adherence to one treatment modality only. Some argued that five-year survival rates for all stages of cervical cancer had reached a plateau. Others claimed that even the best centres in the world had failed to produce 'satisfactory' results. In 1956, for example, Bart's gynaecologist John Howkins cast a critical eye on Kottmeier's 90 per cent 'cure' rates in Stage 1 carcinoma: 'The immediate question that arises from these figures is why the cure rate is not 100 per cent', he commented.[145]

Critics advocated the addition of surgery to radiotherapy, arguing that the two treatments together would achieve better results. Programmes of mixed surgical and radiation treatment began to emerge in the 1950s on the back of such concerns.[146] At the Chelsea Hospital for Women, for example, disappointment over 'static' results of radiotherapy led to increased use of surgery after irradiation, even in the early cases.[147] In 1963 Kottmeier himself introduced post-irradiation surgery at the Radiumhemmet.[148]

The return to surgery must be set in the context of continuing debates about the professional status of gynaecology as a specialty. In England the establishment of the RCOG had brought about the union of obstetrics and gynaecology, but the thunders of Victor Bonney's campaign still reverberated within the profession. People like John Howkins at Bart's, John Stallworthy in Oxford, and Stanley Way in Newcastle, saw themselves as heirs to the surgical tradition represented by the 'master of pelvic surgery'. In the post-war era, it was their work that gave new impetus to the surgical treatment of cervical cancer.[149]

In the United States, the surgical revival was similarly led by a movement of elite gynaecologists who questioned the logic of combining gynaecology with obstetrics, championed by the American Board of Obstetrics and Gynecology. In contrast to Bonney, these gynaecologists did not wish to turn gynaecological surgery into a subspecialty of general surgery, but to establish a new identity for the gynaecologist as a specialist in pelvic surgery. In 1952 the Society of Pelvic Surgeons was founded in New York to improve surgical training for the gynaecologist.[150] While defining themselves as an inter-specialty group, seventeen of its twenty charter members were gynaecologists, including Joseph V. Meigs at Harvard, Richard TeLinde at Johns Hopkins, and Alexander Brunschwig at New York's Memorial Hospital for Cancer and Allied Diseases.

Pelvic surgeons wanted to restore gynaecological surgery to the glory days of its past, when it was an innovative specialty at the cutting edge of surgery. Not only did they revive Wertheim's operation for early stage cervical cancer; they also developed new 'ultra radical' procedures for the treatment of recurrences after radiotherapy.[151] In the late 1940s Brunschwig pioneered the techniques of pelvic exenteration, a procedure involving the removal of the bladder and/or the rectum in addition to the uterus, vagina, fallopian tubes and ovaries.[152] The most radical version of exenteration involved the insertion of the ureters into the colon, which in its turn was connected to the outside by a colostomy. Exenteration stirred harsh and bitter criticism from practitioners who questioned its ethics. Brunschwig himself described his innovative surgery as 'brutal and cruel', but he thought it justifiable as a palliative when radiotherapy had failed.[153] In both Britain and America, the procedure was subsequently applied especially to the treatment of primary carcinoma of the vagina, a type of malignancy that had proved resistant to radiotherapy. According to the American gynaecologist Irwin Kaiser, exenteration could be contemplated here only because the 'salvage' in this group had proved to be very close to nil.[154]

The result of these complex dynamics was that by the early 1950s there was no consensus over the management of cervical cancer. According to Howard Taylor, the distinguished American gynaecologist, 'a sudden influx of new principles, affecting the entire range of therapy from the detection of the disease in the preclinical, asymptomatic stage to the management of the most advanced cases' had revolutionized accepted methods of diagnosis and treatment.[155] Thus 'this formerly most standardized area in cancer therapy is now perhaps the most controversial'.[156] The return of surgery to the field had created new uncertainties for patients and practitioners alike: 'The upsetting of a perhaps prematurely standardized method of management will probably make possible an eventual advance', Taylor wrote. 'But in the meantime the gynaecologist and radiotherapist have to learn to deal with a whole new group of uncertainties and for a while to depend on their own judgment rather than upon reference to the book for daily decisions.'[157] As the gynaecologist learnt to live with the radiotherapist, a new era of 'customized' treatment plans and multi-disciplinary teams was beginning to dawn.

NOTES

1. 'Radium better than Knife: Cancer Optimism', *Newcastle Evening Chronicle*, 19 April 1928.
2. 'Cancer', *The Times*, 20th November 1928, p. 17.
3. Cook, 'The Progress of Radio-Therapy in Gynaecology', p. 383.
4. On the history of radiotherapy in Britain, see Murphy, 'A History of Radiotherapy to 1950'; Cantor, 'The Definition of Radiobiology'; Cantor, 'The MRC's Support for Experimental Radiology'; Domenech and Castañeda, 'Redefining Cancer in the Inter-War Period'. On France, Pinell, *Fight against Cancer*, esp. Chapters 3–6; Close-Koenig, 'A Detour or a Shortcut?' On Canada, Hayter, *An Element of Hope*. On Germany, Van Helvoort, 'Scalpel or Rays'. On the United States, Cantor, 'Radium and the Origins of the National Cancer Institute'.

5. Kevles, *Naked to the Bone*, pp. 25–6.
6. Rowland, ‘Report on the Application of the New Photography’, p. 497.
7. See e.g. Sequeira, ‘Further Observations upon the Treatment of Rodent Ulcer by the *X* rays’, p. 1308; Gamlen, ‘Treatment of Lupus’, p. 1310.
8. Sloan, ‘Report of the Glasgow Obstetric and Gynaecological Society’.
9. Fairbairn, ‘Röntgen Rays in Obstetrics and Gynaecology’, p. 368.
10. Quoted in Van Helvoort, ‘Scalpel or Rays?’, p. 37. *Geheimrat* was a title bestowed in Germany by the Kaiser on prominent academicians. The term also suggested the caricature of the pompous professor.
11. ‘Radium and Cancer’, p. 51.
12. Serwer, ‘The Rise of Radiation Protection’, pp. 159–61.
13. Martindale, *Woman Surgeon*, p. 115.
14. Van Helvoort, ‘Scalpel or Rays?’, esp. pp. 51–5.
15. Martindale, *Woman Surgeon*, p. 115.
16. Ibid., p. 115. See also Lockyer, ‘The Future of Radiology in Gynaecological Practice’, p. 99.
17. Mould, ‘Priority for Radium Therapy of Benign Conditions and Cancer’; Curie, ‘Le radium’, p. 398.
18. For an account of the case see Iredell, ‘The Early History of Radium in London’, p. 207.
19. Mould, Robison and Van Tiggelen, ‘Louis-Frédérick Wickham (1861–1913)’.
20. Butlin, ‘On Radium in the Treatment of Cancer’, p. 1414.
21. Ibid.
22. ‘Radium a “Fraud”, Asserts Dr Doyen’.
23. For a more detailed account, see Moscucci, ‘The “Ineffable Freemasonry of Sex”’, pp. 151–2.
24. Pickstone, ‘Configurations of Cancer Treatments’, p. 176.
25. Cleaves, ‘Radium’, p. 682. On Cleaves see Aronowitz, Aronowitz and Robison, ‘Classics in Brachytherapy: Margaret Cleaves’.
26. On Abbe’s life and work see Silverstone, ‘Robert Abbe: Founder of Radium Therapy in America’. Abbe was a charter member of the American Radium Society, founded in 1916.
27. Abbe, ‘The Use of Radium in Malignant Disease’.
28. Routh, ‘Minor Uterine Operations’, p. 809.

29. Wickham, 'Is Radium a Cure for Cancer?', p. 1749.
30. Pinch, 'Report of the Work', p. 153.
31. For a history of the Radiumhemmet, see Larsson, 'Organization of Radiotherapy and Clinical Oncology in Sweden'. On Forssell, see del Regato, *Radiological Oncologists*, pp. 38–4. On the Stockholm method, see Heyman, 'Experiences of Radiological Treatment of Cancer in Gynaecology'; Whelton, 'Radiation Therapy of Gynecological Malignancies'.
32. 'Radio-Therapy in Cancer of the Uterus'.
33. 'Epitome: Radium in Cancer of the Uterus'.
34. 'Radio-Therapy in Cancer of the Uterus'. Forssner was so impressed that he started to refer the majority of his operable cases to the Radiumhemmet.
35. On Kelly's radium work see Burnam, 'Early Experiences with Radium'; Davis, *Dr Kelly of Hopkins*, pp. 127–34; Aronowitz and Robison, 'Howard Kelly Establishes Gynecologic Brachytherapy'.
36. In 1914 Kelly was summoned by the Faculty of the Maryland Medical Society to respond to the charge of violating medical ethics with regard to the widespread publicity surrounding his radium work. On the day of his hearing, he sailed unexpectedly for Europe to confer with Dominici and other radium authorities. See 'Vexed with Dr Kelly: Maryland Faculty May Charge Violation of Medical Ethics', *New York Times*, 11th January 1914; 'Dr Kelly Sails Suddenly to Europe', *New York Times*, 25th January 1914.
37. Davis, *Dr. Kelly*, p. 128.
38. Donaldson, 'Treatment of Inoperable Carcinoma of the Cervix Uteri with Radium'.
39. Janeway, 'Treatment of Uterine Cancer by Radium'.
40. Ibid., p. 48. See also Donaldson's remarks in 'Reports of Societies: Results of Treatment of Cancer of the Uterus', p. 547.
41. In the 1920s concern with radium as well as X-ray protection led to the establishment of national protection committees; Serwer, 'Rise of Radiation Protection', Chapter 5.
42. See e.g. 'Radiotherapy of Uterine Cancer: the Radiological Subcommission Report', p. 216.
43. 'The Standardization of Treatment by Radium'.
44. Searle, *The Quest for National Efficiency*.

45. In early twentieth-century America, standard-setting emerged as an issue of major concern for leading physicians and intellectuals in the context of professional anxieties about the trade in patent drugs and secret medicines; Marks, *The Progress of Experiment.* Cox-Maksimov describes MRC efforts to forge connections between standard-setting and therapeutic efficacy, arguing that the Council's work in this area was an attempt to demonstrate its social value; Cox-Maksimov, 'The Making of the Clinical Trial in Britain, 1910–1945'.
46. These difficulties reflected wider problems with the development of clinical research in Britain, which are beyond the scope of this volume.
47. Murphy, 'History of Radiotherapy', Chapter 4, pp. 52–3.
48. Critics claimed that the results of the experiment did not justify keeping the radium in one place, and that more patients could be treated by redistributing the radium; Cantor, 'The MRC's Support for Experimental Radiology', p. 184.
49. See TNA FD 1/737, 'Proposed central committee for studies in radiology'.
50. Medical Research Council, *Report for 1923–24*, pp. 6–9.
51. 'Radium Therapy of Cancer of the Cervix', p. 869.
52. Medical Research Council, *Report for 1927–8.*
53. Barclay, 'New Importance of Radium', p. 1061.
54. See Cantor, 'The MRC's Support for Experimental Radiology', p. 190.
55. Barclay, 'New Importance of Radium', p. 1062.
56. 'Radiotherapy in Cancer of the Cervix'.
57. 'Radium for Cancer'.
58. Sturdy and Cooter, 'Science, Scientific Management, and the Transformation of Medicine'; Cooter, 'Keywords in the History of Medicine: Teamwork'.
59. Martindale, *Woman Doctor*, p. 143.
60. On Chambers's life, see Mohr, 'Chambers, Helen (1879–1935)'; 'Obituary: Helen Chambers, CBE, MD Lond.'; 'Obituary and bibliography of Helen Chambers CBE MD BS'.
61. Chambers was decorated with the CBE for her wartime work. On the Endell Street Hospital, see Geddes, 'Deeds *and* words'.
62. Fletcher felt that most of her training had been in the laboratory and that her research into the role of a parasite in the aetiology of

breast cancer was likely to lead nowhere fast; TNA FD 1/2037, Letter from W. Fletcher to G. Newman, 15 December 1923.

63. Martindale, *Woman Surgeon*, p. 207. See also Murphy, 'A History of Radiotherapy to 1950', Chapter 5, pp. 25–31.
64. Chambers, 'The Marie Curie Hospital'. On Platt, see 'Obituary: Kate Platt MD'.
65. Magill, 'The Practice of Radiology and Electro-Therapeutics for Medical Women'. Radiotherapy also proved attractive to female physicians in France. In the interwar period medical women had no chance of entering the official career track in the French medical system, but institutions such as the Curie Foundation in Paris and the Villejuif Cancer Institute, at the margins of the official system, were more amenable to training and promoting women physicians; Löwy, *A Woman's Disease*, pp. 65–6.
66. TNA FD1/697, Newman to Fletcher, 2 April 1925.
67. TNA FD1/697, Fletcher to Newman, 3 April 1925.
68. Chadburn, 'Cancer in Women'; 'Cancer in Women: Benefits of Radium Treatment'.
69. TNA FD1/697, Fletcher to BECC secretary, 4 August 1925.
70. On Hurdon see Koudelka, 'Hurdon, Elizabeth'; Downes and Hart, 'History of Gynecological Pathology VII. Dr Elizabeth Hurdon'.
71. Downes and Hart, 'History of Gynecological Pathology', p. 88.
72. The principle of interrupted dosage of moderately high intensity, with short intervals and a limited intra-cavity radiation, was based on the theory that the cancerous cells were gradually destroyed by successive applications, while the vascular connective tissue had a chance to recover in the intervals. The damaged cancer cells were gradually eliminated by the natural processes of the organism. Hurdon, *Cancer of the Uterus*, p. 53.
73. 'Radium Treatment of Uterine Cancer: Report of the Marie Curie Clinic, London', p. 1025.
74. 'Cancer in Women: Benefits of Radium Treatment'.
75. Chambers, 'The Marie Curie Hospital', p. 20. Elston situates the foundation of the Marie Curie within the long history of hospitals founded by women doctors; Elston, 'Run by Women, (Mainly) for Women', p. 90.
76. 'Treatment of Cancer: a Women's Institute', *The Times*, 2nd June 1928.
77. 'Radium Therapy of Cancer of the Cervix', p. 869.

78. Lens (pseud.), ‘The Marie Curie Hospital’, p. 692. Saleeby’s diatribe provoked an angry response from leading medical commentators.
79. Ibid.
80. See TNA FD1/697 for a list of early supporters.
81. ‘The Marie Curie Hospital’.
82. ‘The Marie Curie Hospital: Dr Lang’s Tribute’, *The Times*, 1st July 1936.
83. ‘British Memorial to Marie Curie: A Daughter’s Tribute’.
84. Ibid. Eve Curie’s biography of her mother played a key role in the creation of the Madame Curie myth; Curie, *Madame Curie: A Biography*. See also Elena, ‘Skirts in the Lab’.
85. Sackville-West, ‘The Marie Curie Hospital’, p. 20.
86. Ibid.
87. Cases were classified under four categories: 1 – early operable; 2 – borderline; 3 – inoperable; and 4 – hopeless.
88. Chambers, ‘The Marie Curie Hospital’, pp. 21–2.
89. Chadburn, ‘The Marie Curie Hospital’, p. 48.
90. ‘The Marie Curie Hospital: Prime Minister’s Tribute’; ‘Cancer Research: Success of Radium Treatment. Laboratories opened by Queen Mary’.
91. ‘Prime Minister’s Tribute’, p. 1105.
92. Ibid. See also Martindale, *Woman Surgeon*, pp. 209–10.
93. Chadburn, ‘The Marie Curie Hospital’, p. 49.
94. Close-Koenig ‘A Detour or a Shortcut?’
95. Pinell, *Fight against Cancer*, Chapter 4.
96. Murray, *Women as Army Surgeons*, p. 161.
97. TNA MH 58/150, A. B. S. Smallman, ‘Some Considerations Regarding Radium in the Treatment of Cancer’; ‘Results of Treatment of Uterine Cancer’.
98. Murphy, ‘History of Radiotherapy’, Chapter 5, p. 65.
99. Buchanan, ‘Collective Public Effort in Dealing with Cancer’, p. 551. See also ‘The Radium Problem’.
100. For a biography, see Winkelstein, Jr., ‘Claypon, Janet Elizabeth Lane- (1877–1967)’.
101. Lane-Claypon, *Cancer of the Uterus.*
102. Ibid., pp. 58–9.
103. Donaldson, ‘The Advantages of Radiation’, p. 75.
104. Donaldson , in ‘Discussion on the Position of Radium’, p. 1065.
105. Prochaska, *Philanthropy and the Hospitals of London*, pp. 115–17.

106. Barclay, 'The New Importance of Radium'.
107. Shaw, 'Treatment of Cancer by Radium'. Shaw's response to the problem was to generate his own statistics. In 1928 he persuaded Donald Dougal, Professor of Gynaecology and Obstetrics at the University of Manchester, to carry out an experimental trial of radium therapy on their own cases; Shaw and Dougal, 'Results of Treatment of Carcinoma of the Cervix Uteri'.
108. Bonney, 'Surgical Treatment of Carcinoma of the Cervix'. Radium enthusiasts retorted that the case for radical hysterectomy also rested largely on foreign statistics; Birkett, 'Treatment of Cancer by Radium'.
109. Lane-Claypon, *Cancer of the Uterus*, pp. 7–8.
110. Forsdike, 'Treatment of Cancer by Radium'.
111. Schmitz, 'The Classification of Uterine Carcinoma for Study of the Efficacy of Radium Therapy'.
112. Hueper and Schmitz, 'Relations of Histological Structure and Clinical Grouping'.
113. Stevens, 'Carcinoma of the Cervix'.
114. Winter, 'Noch einmal die Carcinomstatistik'.
115. 'Radiotherapy of Uterine Cancer: Methods, Records, and Results (Editorial)'. On the League of Nations' staging system, see Odicino *et al.*, 'History of the FIGO Cancer Staging System'; di Paola, 'History of and Rational [*sic*] for Staging Gynaecological Cancers'. On the Cancer Committee of the League of Nations Health Organization, see Borowy, *Coming to Terms with World Health*, pp. 261–8.
116. For details see 'Cancer of the Uterine Cervix'.
117. Heyman, 'International Agreement on Stage-Grouping in Cancer of the Cervix Uteri'.
118. 'Cancer of the Uterine Cervix'. For a history see Benedet and Pettersson, 'History of the *Annual Report*'.
119. Heyman and Strandquist, *Health Organization. Inquiry into the Results of Radiotherapy in Cancer of the Uterus. Atlas Illustrating the Division of Cancer of the Uterine Cervix.*
120. Löwy, *A Woman's Disease*, p. 77.
121. The practice of restaging was still widespread in the 1950s, however; see 'Cancer of the Cervix'.
122. Heyman, 'International Agreement'. For details of the revised classification, see 'Stages of Cervical Cancer'.
123. Benedet and Pettersson, 'History of the *Annual Report*'.

124. Ménoret, 'The Genesis of the Notion of Stages in Oncology'.
125. Clinical staging includes conization and amputation of the cervix, but not lymphography, arteriography, venography, laparoscopy, ultrasound, CT or MRI. For a detailed discussion of the differences between FIGO and TNM classifications, see Hermanek, 'Why TNM System for Staging of Gynecologic Tumours?'
126. Jones, 'Staging and Pretreatment Evaluation of Women with Cervical Cancer'.
127. Marsden and Hacker, 'Controversies and New Trends in Staging Vulval and Vaginal Carcinoma'.
128. di Paola, 'History of and Rational [*sic*] for Staging', p. 231.
129. 'The Medical Uses of Radium', p. 122.
130. TNA MH 55/34, A.B.S. Smallman, 'Cancer of the Uterus: Radium Treatment in Poor Law Institutions', November 1927.
131. TNA, MH 55/34, 'Cancer of the Uterus: Radium Treatment in Poor Law Institutions', C. Berkeley to G. Newman, 4 December 1927.
132. Murphy has suggested that the proposed private enterprise was not in accord with the 'Tory socialism' of the time; Murphy, 'History of Radiotherapy', Chapter 5, p. 58.
133. TNA MH 55/35, 'Cancer of the Uterus: Radium Treatment in Poor Law Hospitals', 28 September 1928. Ministry of Health Circular D2318-600.
134. Buchanan, 'Collective Public Effort in Dealing with Cancer', p. 552.
135. Ibid.
136. TNA MH 55/34, A.B.S. Smallman, 'Cancer of the Uterus: Radium Treatment in Poor Law Institutions', November 1927.
137. Stewart, 'The Finest Municipal Hospital Service in the World?'
138. *Ninth Annual Report of the National Radium Trust and the Radium Commission, 1937–8, Including a Statistical Report.*
139. Shaw and Dougal, 'Results of Radium Treatment', p. 788.
140. Passe, 'Irradiation or Surgery for Cancer?', p. 1231.
141. RCOG A3/6, Minutes of the Financial and Executive Committee, 9 October 1949.
142. 'Organization for the Treatment of Carcinoma'; 'Joint Cancer Consultation Clinics: Royal Marsden Hospital's initiative'.
143. RCOG A3/6, Minutes of the Finance and Executive Committee, 9 October 1949.
144. RCOG C/1, 'Memorandum on Gynaecological Cancer', Standing Committee of the Three Royal Colleges, 10 February 1954.

145. Howkins, 'The Place of Surgery in the Treatment of Carcinoma of the Cervix', p. 522.
146. Schlink, 'Cancer of the Cervix Uteri'. Australian gynaecologist Herbert Schlink was particularly influential in Britain. See also Glucksmann and Way, 'On the Choice of Treatment of Individual Carcinomas of the Cervix'; Currie, 'The Association of Radium and Surgery in the Treatment of Carcinoma of the Cervix'.
147. Blaikley, Lederman and Pollard, 'Carcinoma of the Cervix at Chelsea Hospital for Women'.
148. Stallworthy, 'Stage II Carcinoma of the Cervix'.
149. Both Howkins and Stallworthy had trained with Bonney (at the Middlesex and at the Chelsea respectively), while Way was an avowed disciple. See John Howkins's obituary, *Plarr's Lives Online*; Lopes *et al.*, *Bonney's Gynaecological Surgery*, p. ix.
150. Zetka, 'Establishing Specialty Jurisdictions in Medicine'. For a contemporary analysis, see Burch, 'What's Wrong with Pelvic Surgery?'
151. Meigs, 'The Radical Operation for Cancer of the Cervix'.
152. Brunschwig, 'Complete Excision of Pelvic Viscera for Advanced Carcinoma'.
153. Ibid., p. 181.
154. Kaiser, 'Primary Carcinoma of the Vagina', p. 1159. On pelvic exenteration in Britain, see 'Section of Obstetrics and Gynaecology: Discussion on Pelvic Exenteration'.
155. Taylor, 'Controversial Points in the Treatment of Carcinoma of the Cervix', p. 440.
156. Ibid., on p. 435.
157. Ibid.

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CHAPTER 6

Visions of Utopia

By the 1930s the penny was beginning to drop that neither surgery, nor radiotherapy were likely to produce a 'cure' for cancer. Disappointing results provided an incentive to step up the early detection effort. Writing in 1937, the American gynaecologist Emil Novak stated that 'in the treatment of cancer of the cervix the profession seems to have reached an essential impasse with our present-day methods … For the present, therefore, the obvious point of attack in the cancer campaign lies in the effort to increase the proportion of the early cases in which treatment gives such a worth while chance for cure.'[1] The general consensus was that the earlier the stage in which the cancer was discovered, the better were the patient's chances of cure. But it was one thing to diagnose cancer 'early', and quite another to diagnose 'early cancer': 'Even in the so-called early cases, the pathologic process is quite well established and has made some inroads', the American physician Fred Emmert wrote in 1934. 'One must try, therefore, to detect cancer at a still earlier, in fact, at its earliest stage, and, if possible, go even beyond this to the precancerous condition which may give rise to malignant degeneration.'[2] Canadian gynaecologist Ernest Ayre asserted in 1948 that 'most clinical cancer is not early, even though it may be small', adding that 'so long as one has to depend on visual recognition for diagnosis, treatment is going to meet the same frustration as at present'.[3]

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In the early decades of the twentieth century this realization served to shift the attention on to the detection of abnormalities which, though not corresponding to the gross appearance of cancer, might have represented an early phase of malignant change. A variety of terms came into use to describe such abnormalities: ‘covert’ or ‘latent’ carcinoma, ‘beginning cancer’, ‘carcinoma *in situ*’ and ‘pre-cancer’, each hinting at different ways of understanding what cancer was and how it developed in the body.[4] The key feature of all such abnormalities was that they did not announce their presence by producing overt clinical signs and symptoms. They could thus only be discovered by chance or through a deliberate effort. In 1938 the American gynaecologist Karl Martzloff wrote that ‘the ability to recognize clinically such processes represents a sort of cancer utopia which has probably been the dream of every physician at some stage of his medical career and is still the goal of many students of cancer’.[5]

Cervical cancer occupies a crucial place in the history of cancer control policies because it was the first malignancy for which mass screening programmes were instituted in the mid-twentieth century. In its turn, cervical cancer screening became a model for screening for other malignancies: breast, colon and prostate. Methods aimed at detecting pre-symptomatic carcinoma of the cervix were developed from the late 1920s. The most studied from the historical point of view have been the techniques of colposcopy, introduced in Germany during the 1930s, and the vaginal smear developed by Papanicolaou in the United States during the late 1920s. Scholars have documented how the Pap smear and the colposcope became tools for mass screening, highlighting important differences in the reception of the two methods outside their respective countries of origin.[6] The UK programme, introduced in 1966 after an intense media-driven campaign, originally used the Pap smear as the primary screen (this was changed to liquid-based cytology in 2008); from the 1980s onwards, a colposcopic examination (often coupled with a biopsy) was gradually added as a secondary screen for women with borderline changes. An account of these developments is clearly beyond the scope of this volume. There is a ‘pre-history’ of cervical cancer screening in Britain, though, which can to some extent illuminate the more recent history. Historian Yolanda Eraso proposes that the history of the detection of cervical cancer can be read ‘as a story of academic exchanges, migrating people, personal contacts, and nationalistic zeal’.[7] It can also be read as a story shaped by different healthcare systems. I argue in this chapter that ‘screening’ for disease is a quintessentially American concept, originating from dynamics peculiar to the development of public health activity in the United States during the second quarter of the twentieth century. In contrast to the United States, British public health officials never showed much enthusiasm for screening as a public health tool. Thus although Britain did produce a cytological method of cancer diagnosis that might have been developed into an alternative to the Pap smear, the low priority accorded to disease screening in Britain ensured that its possibilities were never realized.

What Is 'Latent' Carcinoma of the Cervix?

Probably the first description of a superficial, non-proliferative lesion of the cervix was made in 1886 by Dr (later Sir) John Williams, Professor of Midwifery at London's University College. The patient had been successfully treated of a menstrual irregularity and she complained of no gynaecological symptoms, but Williams was concerned that a portion of the cervix did not appear as healthy as the rest. Microscopic examination of a tissue specimen revealed evidence of infiltrative growth into the deeper epithelial layers, and the glands lying in them. Commenting on the case, Williams wrote: 'This is the earliest condition of undoubted cancer of the portio vaginalis which I have met with, and it is the earliest condition which is recognisable as cancer. It presented no distinctive symptom and was discovered accidentally; its nature was not recognised with certainty, but was held in suspicion.'[8]

In 1908 W. Schauenstein, an obscure gynaecologist from Graz, Austria, proposed the view that invasive cervical cancer derived from asymptomatic changes in surface epithelium, which he called 'oberflächenkarzinom' or 'surface carcinoma'.[9] Further support for this view came from K. Pronai in 1909, and from Isador Rubin in 1910.[10] Rubin asserted that 'pathological examination … may often furnish the first evidence of a latent carcinoma', and that it was possible in this way to diagnose cervical malignancies at the pre-clinical (asymptomatic) stage.[11] The term 'carcinoma *in situ*' (CIS) was first used by Schottländer and Kermauner in a textbook published in 1912, although it did not enter the medical lexicon until the American pathologist A. C. Broders published a paper on this topic in 1932.[12]

Those who subscribed to the notion of 'incipient' or 'latent' cervical cancer held that it was in the structure of the cell that the first predisposition to carcinoma was to be seen. This was highly controversial in the first half of the twentieth century. The dominant definition of cancer, originally proposed by Virchow, demanded demonstration of tissue invasion. If a cell had not acquired the ability to penetrate the basal membrane that separates the epithelium from other tissues, it was not regarded as ‘cancer’. Furthermore, it was unclear whether pre-cancerous lesions inevitably ‘progressed’ to invasion and full-blown malignancy, or whether they might regress and return to normality.

In the 1920s a number of German-speaking pathologists and gynaecologists proposed that *leukoplakia* (Greek for ‘white plaques’), a condition which had been associated with cancer of the vulva and tongue, was a precursor of cervical cancer. A lot of research was carried out to demonstrate that leukoplakia was a manifestation of malignant change. The problem with these white patches was that they were very difficult to visualize by naked-eye examination. Efforts to detect invisible areas of leukoplakia on the cervix resulted in the development of two new diagnostic methods, one derived from standard laboratory staining techniques, the other from existing methods of gynaecological diagnosis: the Schiller test, and the colposcope.

Schiller’s Test

In the late 1920s pathologist Walter Schiller, the Director of Laboratories at the Second Gynaecological Clinic in Vienna (Wertheim’s clinic), developed the idea of identifying leukoplakia by some form of *in vivo* staining.[13] His attention was directed to the observations of Lahm and others that carcinomatous cells lose their ability to secrete glycogen. He thus tried to find a stain that would differentiate the healthy glycogen-rich cells from potentially dysplastic and carcinomatous areas on the cervix. After several unsuccessful attempts he came up with the idea of using Gram’s stain, an iodine solution used to stain bacteria.[14] The method (later called the Schiller test), was a simple, rapid and inexpensive means of detecting abnormal lesions. It was not a diagnostic tool for cervical carcinoma, however, since many non-neoplastic conditions also resulted in non-staining areas. Schiller emphasized that histological examination of suspicious spots was required to confirm a malignancy: he thought that scraping off the superficial epithelium with a sharp spoon was all that was needed for the purpose. In 1933 he proposed the routine use of Gram’s stain for the detection of ‘beginning carcinoma’. Schiller objected to the view that the word ‘carcinoma’ should be reserved for invasive lesions only, and he recommended a radical hysterectomy followed by radiotherapy in all cases where ‘young carcinoma’ was discovered.

During the 1930s many gynaecologists in Britain, North America and continental Europe adopted Schiller's test, either on its own or, more rarely, in conjunction with the colposcope (discussed below).[15] But the test also attracted criticism from a number of gynaecologists, particularly in North America. Some clinicians claimed that it was superfluous, arguing that an experienced specialist could detect suspicious cells using only a speculum and a good light.[16] Others were concerned about the high number of false positives given by the test, claiming that the procedure was likely to cause undue anxiety all round and lead to unnecessary biopsies.[17] The use of cervical biopsy and curettage in gynaecology had risen steadily since the late 1920s, as clinicians increasingly relied on the pathologist to clarify the nature of clinically suspicious lesions.[18] Not everyone welcomed the trend, however, since complications did occur from time to time after a biopsy, and the changes and scarring in the cervix could lead to infertility and miscarriage. Furthermore, many practitioners believed that biopsies caused dissemination of cancer cells to other sites, resulting in increased risk of metastasis.

Hinselmann's Colposcope

A different approach to the problem of visualizing latent carcinomas of the cervix developed out of a research project undertaken in the 1920s by German gynaecologist Hans Hinselmann. The only child of an old family from Neumünster, Hinselmann qualified in medicine in 1908, and in 1911 he entered the gynaecological clinic directed by Professor Otto Von Franqué in Giessen.[19] In 1912 he followed his teacher into the Gynaecological Clinic in Bonn, where he stayed until 1924. During this period Hinselmann was assigned to investigate leukoplakia of the cervix, which was one of Von Franqué's main research interests. Hinselmann had great difficulty in detecting these tiny lesions by speculum examination, so he tried to enlarge the normal view. Working in collaboration with the Leitz optical company, in 1924 he produced an instrument for visual inspection of the cervix at a magnified scale: a binocular microscope mounted on a tripod, with a light source and a mirror to direct the light. Hinselmann called his instrument a 'colposcope', from the Greek words 'kolpos' (womb), and 'skopein' (to look at).

In Hinselmann's first experiments colposcopic examination was almost impossible because the focal distance was no more than 80 mm. In an effort to solve the problem, he pulled out the cervix with a small forceps.

The procedure defeated its purpose, however, both because it altered the vascular morphology of the examined part, and because it occasionally caused bleeding. Besides, it was most uncomfortable for the patient. Hinselmann thus endeavoured to produce an improved version of the instrument with higher magnifications. He added a movable stand and a screw for fine magnification adjustments. He also started to use acetic acid to enhance the colposcopic view of abnormal epithelium. When Schiller published the details of his staining method, Hinselmann recognized its importance and he began to use it in conjunction with the colposcope (though apparently not as a routine). He subsequently experimented with all manner of acids, colours, fluorescent substances and special sources of light, in the belief that colposcopy could become a sort of histopathology *in vivo*.

The colposcope did not produce simply an enlarged view of the lesions Hinselmann was expecting to find, though: it revealed appearances never seen before. By studying leukoplakia Hinselmann discovered fine new patterns under the keratin which he called *grund*, or ground of leukoplakia (punctation), and *felderung* (now known as mosaic leukoplakia). Hinselmann regarded leukoplakia, punctation and mosaic as indicators of malignant transformation, and he referred to these appearances collectively as the *matrix area* of carcinoma. He complemented his colposcopic work with rigorous histological investigations. Biopsies from colposcopic areas of leukoplakia, punctation or mosaic returned not only atypical epithelium, but also epithelium that was barely distinguishable from carcinomatous atypia. Hinselmann designated minimally altered epithelium as 'simple atypical', and epithelium showing malignant atypia as 'markedly atypical'. But he had great difficulty in convincing German pathologists that the 'precursor' lesions discovered by colposcopy were actually malignant: the great majority of pathologists insisted that non-invasive lesions were not 'cancer'. In order to avoid controversy, Hinselmann decided not to class the lesions according to histologic findings. He devised instead a new system of classification of the lesions into four 'Rubriks' (groups): atypical epithelium I and II, and highly atypical epithelium III and IV. But even his followers found the terminology confusing, and a number of attempts were subsequently made to improve on the original system.[20]

Hinselmann published various articles describing epithelial changes which he called 'precancerosis', and he advocated the establishment of a colposcopic centre for the prevention of cervical cancer. His proposal came to fruition when he moved to the Altona City Hospital (Hamburg), where he became the director of the Gynaecological Department. Hinselmann claimed that the mortality from cervical cancer would virtually disappear if all gynaecologists adopted his instrument.[21] In 1932 the Hamburg branch of the Allgemeine Ortskrankenkasse ('general local health fund') was the first to offer to insured women a free colposcopic examination, performed by its specialists, if they requested it.

Not all gynaecologists were convinced that the colposcope was a major breakthrough in prevention. The much-hyped instrument was criticized in Hinselmann's own country. At a meeting held in Berlin in 1937, a number of gynaecologists objected that the instrument was an unnecessary addition to the means of diagnosis already available. A more common objection was that colposcopic examinations were too time-consuming.[22] Nevertheless, in the interwar years the use of the colposcope gradually spread in Germany and in other areas of German language and culture. The dissemination of the method in German-speaking countries was no doubt facilitated by the fact that early detection of gynaecological carcinoma had long been a major issue for German gynaecologists. Anti-cancer policies in the Nazi era further reinforced the emphasis on early detection, stimulating proposals for mass screening of the population. Viennese gynaecologist and anti-tobacco activist Robert Hofstätter, for example, advocated semi-annual examinations for all women over the age of thirty. He went so far as arguing that women who failed to submit to such exams should be penalized for placing an additional burden on the insurance system if they subsequently became ill.[23]

During the interwar years the colposcope spread to South America, thanks in part to the establishment of institutions on both sides of the Atlantic which facilitated academic exchanges between Germany and Latin America. Particularly in Argentina, Brazil and Chile, colposcopy was well established by the late 1940s as a viable alternative to the Pap smear. Screening programmes that employed colposcopy as the initial screening tool were instituted in Brazil from the late 1940s onwards.[24]

Acceptance of the method outside of German-speaking and South American countries was quite slow, particularly during the interwar period. Eraso has drawn attention to American critiques of colposcopy. Nevertheless, the Americans seem to have been more receptive to the new technology than the British, possibly because the practice of periodical examinations in which the colposcope was incorporated was already well established in the United States. In the early 1930s Emmert, Levy, Broder and Sacks called attention to the colposcope.[25] Philadelphia gynaecologist

Charles Norris proposed in 1934 that periodical examinations of patients during the cancer ages, aided by the Schiller test and the colposcope in suspicious cases, would lead to the discovery of 'at least a few' early cases.[26] By comparison, the attitude in Britain was one of indifference. Cardiff specialist Gilbert Strachan mentions the colposcope in a paper published in 1937, and it seems that Fletcher Shaw, the Manchester gynaecologist, had a colposcope delivered to his department after visiting Hinselmann's clinic in 1937.[27] But a perusal of the gynaecological literature of the time reveals no direct references to the instrument. Writing in 1956, gynaecologist James Andrew asserted that colposcopy had found little favour amongst British gynaecologists, chiefly because of the lack of easily manoeuvrable and affordable machines.[28] There were other reasons, too. Strachan, who had an interest in the 'precancerous cervix' and used the colposcope for research, observed in 1937 that the relationship between leukoplakia and cancer could not be proved. Furthermore, as leukoplakia of the cervix was a rare condition, 'much tedious work, with little tangible result', was entailed in the search for cervical pre-cancerous lesions.[29] British gynaecologists were not alone in thinking that colposcopic examinations were too time-consuming: North American critics also emphasized the time it took to carry out a careful colposcopic study.[30] This problem might have been overcome by training technicians or nurses to do the work, but this possibility was not entertained in America until the early 1970s. One reason for this may have been that the technique required the use of the speculum. American gynaecologists would not even allow nurses to use the speculum, since they regarded speculum examinations as a medical procedure.[31] It was not until the introduction of nurse practitioners in the late 1960s that registered nurses with advanced degrees were trained to do colposcopic examinations in the Unted States.[32] 'Nurse colposcopists' were also introduced in Britain from the late 1990s onwards.

Bearing in mind British anxieties about the use of the speculum, it is also possible that practitioners may have regarded colposcopic examinations as too intrusive. Ultimately, though, it was the broader political climate that undermined professional support for colposcopy in Britain. In 1937 members of the Gynaecological Visiting Society, a peripatetic association of elite British gynaecologists created in 1911 to foster the dissemination and cross-fertilization of ideas amongst specialists, travelled to Altona to see Hinselmann's department. One of the operations they saw was a sterilization procedure at a time when forced sterilizations were allowed in Germany. This served to dampen any enthusiasm British gynaecologists might have felt for the colposcope. When war broke out, all scientific exchanges between Germany and England were suspended. Then in 1946 a British Military Government Court in Hamburg sentenced Hinselmann to three years in prison for the sterilization of six gypsies. His former student Eduard Wirths (the chief SS doctor at Auschwitz) was also condemned for his experimental research on camp inmates, which used the colposcope to detect pre-cancerous growths on the cervix. If an abnormality was found, the cervix was surgically removed and sent to back to Hamburg-Altona for examination by Wirths's brother Helmut, a noted gynaecologist who collaborated with Hinselmann in the study of leukoplakia. The poor conditions of Auschwitz inmates made for many complications. Wirths's subject suffered from infections and haemorrhages, some of which either caused deaths, or else left patients so debilitated that they were selected for the gas chamber.[33]

Scientific communications between England and Germany gradually resumed after the war. Training opportunities in the techniques of colposcopy, either in Hamburg from Hinselmann himself, or from experts at other established centres (such as Tassilo Antoine in Vienna) became available for British and American gynaecologists in the early 1950s.[34] Eraso has drawn attention to the role played by Hinselmann's South American disciples as agents in the transmission of colposcopic techniques to Latin America. In most Anglo-Saxon countries the process of transmission began in the 1950s, when the first German-trained gynaecologists began to seed the methods of colposcopy in Britain, North America and Australasia. The key people were Karl Bolten (first in Philadelphia, and subsequently in New Orleans), Malcolm Coppleson (Sydney), and James Andrew (London). Both Bolten and Coppleson were trained by Hinselmann, while Andrew studied in Vienna with Tassilo Antoine, the gynaecologist who introduced colpo-microscopy. One of the pioneers of colposcopy in Britain was Sir John Stallworthy, a New Zealander who had settled in England during the 1930s. It is not clear how Stallworthy had become interested in colposcopy, although it may be significant that in the late 1930s he studied with Oskar Frankl, the chief pathologist in Schauta's clinic in Vienna. Stallworthy started a colposcopy clinic in Oxford sometime during the early 1950s, and he encouraged some of his juniors, notably Malcolm Coppleson, to take up colposcopy. Coppleson in his turn trained a number of individuals who went on to play a key role in the development of the technique in Australia and New Zealand, including the Australian gynaecologist Albert Singer. Singer moved to Oxford in 1970. In 1972 he and two others, Birmingham University lecturer Joe Jordan and Dr Archie Crompton, a Leeds gynaecologist who had trained in the methods of colposcopy in Germany, launched the British Colposcopy Group (BCG). In 1972 the International Federation for Cervical Pathology and Colposcopy was founded in Argentina to promote the practice of colposcopy worldwide. As only national societies were eligible for membership, in 1975 the BCG was renamed the British Society for Colposcopy and Cervical Pathology, with Joe Jordan as President.

In the period immediately following the war, it was the Pap smear developed in the United States that captured the attention of British gynaecologists, largely thanks to the intense publicity campaign engineered by the American Cancer Society (ACS). Grants from the BECC, the Royal College of Obstetricians and Gynaecologists and hospital endowment funds served to kick-start a modest programme of cytological research in Britain. By the late 1950s, a number of gynaecological clinics had adopted the Pap smear as a routine procedure for the detection of carcinoma of the female genital tract. Colposcopy began to gain some support in the late 1950s, first as a means of carrying out a 'directed' biopsy after an abnormal smear, and later as a secondary screening method after abnormal cervical cytology. Colposcopy advocates proposed that neither the colposcope, nor the Pap smear should be used on its own, since false negative results could be found with both methods. Used in combination, however, the two methods would compensate for each other's fallibility, thus giving gynaecologists greater confidence in the management of suspicious and borderline lesions. Historians are yet to explore the dynamics that led to greater acceptance of the colposcope in Britain. It is to be hoped that future research will illuminate this complex and fascinating subject.

Diagnosing Cervical Cancer from Cells

Methods of cytological diagnosis of cervical cancer developed serendipitously in parallel with colposcopy. They were controversial because the great majority of pathologists and surgeons believed that the study of cells had no place in the diagnosis of solid tumours. The standard method in the early twentieth century relied on the microscopic examination of a biopsy specimen, and the evaluation of the architectural pattern of the cells in relation to each other.[35] Thus John Bland-Sutton, the eminent surgeon, asserted in 1922 that 'in the appearance of a cell from cancer there is nothing characteristic of the disease, nothing that would lead a pathologist to identify it as a malignant cell. Cancer can only be identified in sections showing the relation of the cells to each other in a group.'[36]

Then in 1928 Greek-born George Papanicolaou, a research assistant in the Anatomy Department of Cornell University, presented a paper at the Third Race Betterment Conference held at Battle Creek, Michigan, in which he proposed that cervical cancer may be diagnosed by studying the appearance of the cells present in the female genital tract. The paper was a by-product of fundamental research on the sexual cycle of mammals. Papanicolaou, who had degrees in both medicine and zoology, had an interest in the determination of sex.[37] The research, which initially involved female guinea pigs, required him to obtain ova at a precise stage of development. He thus studied changes induced by the hormonal cycle in the vagina to pinpoint the time of ovulation, using a pipette to collect the vaginal secretions. Papanicolaou subsequently extended his method to study the phases of the sexual cycle of the 'human female'.[38] During the course of this research, he had to familiarize himself with the appearance of both normal and abnormal cell changes in the vagina. It was in this way that he identified characteristic abnormalities in the smears of female volunteers diagnosed with genital cancer. Papanicolaou asserted that malignant cells were morphologically very different from non-cancerous cells, and that 'certain cases of carcinoma of the cervix may be diagnosed by the presence of only one of these cells'.[39] During the 1930s he developed the vaginal smear as a biological assay for oestrogen, and he also used it for endocrine evaluation of infertility patients. Cancer diagnosis did not form part of this research until 1939, when his 1928 report attracted the attention of Dr Joseph Hinsey, the new Chair of the Department of Anatomy at Cornell. Hinsey urged Papanicolaou to give up his work on hormones, and devote himself to developing the vaginal smear as a method for the diagnosis of cervical cancer. This he did in collaboration with Herbert Traut, one of the gynaecologists at Cornell. But their attempt to turn the vaginal smear into a diagnostic tool did not succeed, as shall be seen later.

Meanwhile in London Leonard Dudgeon, Professor of Pathology at St Thomas' Hospital, had independently developed a cytological test which had proved very successful in the detection of a number of solid tumours, including cervical cancer. The origins of Dudgeon's 'wet-film' method must be set in the context of attempts to provide an alternative to frozen section biopsy during surgery. Introduced in the late 1800s, this procedure was widely regarded as unsatisfactory by the 1920s. Pathologists complained that the freezing process altered the normal architecture of the tissues and the appearance of cells, thus reducing the accuracy of the diagnosis. In an effort to make diagnosis more dependable, a few pathologists and surgeons began to experiment with alternative techniques. The new methods applied the concept of 'surface' biopsy to the study of cancer: they were based on microscopic examination of fresh smears of living cells, using the staining and fixing techniques already established in the fields of haematology, bacteriology and parasitology. In the United States, for example, neuropathologist Louise Eisenhardt and neurosurgeon Harvey Cushing pioneered a method for the immediate diagnosis of brain tumours, which used the 'supravital' staining technique originally applied by medical researcher Florence Sabin to the study of living blood cells.[40]

Born in 1876, Leonard Dudgeon was educated at University College London and St Thomas' Hospital. After a short period as a pathologist at the West London Hospital, in 1903 he returned to St Thomas', where he spent the rest of his working life. At Thomas' he became associated with Louis Leopold Jenner and Samuel Shattock, playing an important role in the establishment of bacteriology as a specialized subject. He was appointed Director of the pathological laboratory in 1905; Professor of Pathology in the University of London in 1919; curator of the Shattock Museum in 1927, and dean of the medical school in 1928. During the First World War he served with great distinction as Colonel Consultant Bacteriologist in Salonika.[41]

Dudgeon first used the 'wet-film' technique in 1924, as a tool for investigating the bacteriology of human milk.[42] The transformation of the technique into a method of intra-operative diagnosis was driven by the immediate needs of surgical practice at St Thomas'. In an article on the history of pathology at St Thomas', pathologists Foster and Pinniger write that Dudgeon was one of the pioneers in the clinical application of pathology, adding that this orientation at St. Thomas' was very different form that at many other London teaching hospitals. Dudgeon established close collaborations with his clinical colleagues. He was often called into the wards to help with a difficult diagnosis, and clinicians such as Sir Seymour Sharkey, the physician, and Sir Cuthbert Wallace, the surgeon, were frequently in his laboratory to discuss their problems.[43]

Dudgeon developed the 'wet-film' technique in collaboration with two surgeons: C. Vincent Patrick and Norman Barrett, the thoracic surgeon.[44] The tissue, removed fresh from operation, was incised and scraped with a sharp scalpel. The 'juice' thus obtained was then smeared on a glass slide and fixed, while still wet, in Schaudinn's fluid (a fixative used in the study of protozoa), stained with Mayer's haematoxylin and eosin, and mounted in Canada balsam. The method had much in common with the scraping technique developed around the same time by Aurel Babeş, the Romanian gynaecologist. Babeş had an interest in the detection of pre-invasive and early invasive malignancies of the cervix. He came up with the idea of carrying out 'surface' biopsies to study suspicious lesions, using a platinum loop to transfer material from the affected area to the slides. He then fixed it with methanol and stained it with Giemsa, a solution used to stain plasmodia.[45] In 1927 Babeş presented the method to the Romanian Society of Gynaecology, and in 1928 he published the full communication in the French journal *Presse Médicale*.[46] His observations were confirmed in 1928 by an Italian gynaecologist named Odorico Viana, but the method failed to attract wider attention.[47]

Dudgeon published a number of papers on the wet-film method. The first one, published in 1927 with Vincent Patrick, gave an account of 200 cases of new growths and inflammatory diseases. The second paper, published in 1934 with Norman Barrett, analysed over 1000 additional cases and described the extension of the method to pathological processes in general. In both series of cases the results compared very favourably with those from paraffin section, the ultimate gold standard in tissue diagnosis. But the study of wet films also had wider implications for cancer diagnosis: it led to the fundamental insight that the examination of single cells was as valuable as the study of tissues. In the paper published with Barrett, Dudgeon stated that malignant cells were different in appearance from normal cells: they stained more deeply than normal cells, they varied in size and shape, and the nucleoli were much larger than normal.[48] Dudgeon emphasized that a solitary cell could not be pronounced malignant on its own merits, but the diagnosis was not difficult in a field where benign cells were present for comparison. The key point was that the presence or absence of invasion of normal tissue was not a relevant consideration for cancer diagnosis.

Dudgeon and colleagues noted that the wet-film method was effective, simple and inexpensive. Furthermore, as all the necessary materials could be transported in a small box, it could be used away from the laboratory – for example, in the out-patient departments and wards of a hospital, or in a consulting room. Working in collaboration with his colleagues in the gynaecological department, A. J. Wrigley and R. K. Bowes, during the early 1930s Dudgeon began to extend the use of the method to the diagnosis of lesions of the female genital tract, including cancer of the cervix.[49] He subsequently turned his attention to the detection of malignant cells in a wide range of bodily secretions – from sputum, to pleural and peritoneal fluids. His unexpected death in 1938 after a cholecystectomy brought his activities to a premature end, but the research was continued at St Thomas' by his successor, the pathologist Joe Bamforth.

The most consistent use of the wet-film method has been made by neurosurgeons for the immediate diagnosis of brain tumours, and in Britain this application has been routine since the late 1930s. During the early 1950s the publicity surrounding the work of Papanicolaou served to stimulate interest in the application of the wet-film method to the detection of asymptomatic carcinoma. Pathologists Joe Bamforth at St Thomas' and Frank Philps at University College Hospital, London, worked on the detection of bronchial carcinoma; gynaecologists C. Swan and K. Dempster at St Thomas', and John Brudenell at King's College Hospital, London, investigated its potential as an aid to the diagnosis of pre-invasive cancer of the cervix.[50] In a study published in 1956, Brudenell observed that the technique was much easier to use than the 'complicated method described by Papanicolaou', and that uniform staining of smears was more readily obtained by the wet-film method than by the Papanicolaou technique. The main disadvantage was that reading the slides was time-consuming, but this was also one of the problems with the Pap smear.[51]

As Casper and Clarke have argued, the Pap smear required much 'tinkering' before it could become the 'right' tool for the job of screening. Tinkering with Dudgeon's method might also have served to transform the technique into a screening tool. Yet this did not happen: in Britain the wet-film technique continued to be used mainly as an intra-operative diagnostic method. In 1958, as enthusiasm for the Pap smear spread from North America to Britain, gynaecologist A. F. Anderson portrayed Dudgeon's work as a history of failure, praising Papanicolaou as the man who had laid the foundation stone of cytological cancer diagnosis *before* operation:

> Cancer cells have been recognized microscopically for almost one hundred years. E. H. Shaw, L. S. Dudgeon and A. J. Wrigley have … published papers on the wet film method of examination of fresh specimens … In most cases these workers were trying to hasten the pathology report of tissues obtained when the patient was already anaesthetized and a biopsy of a tumour immediately available. Dudgeon's descriptions of malignant cells are very much the same as Papanicolaou's … but clinical application still did not follow.[52]

Those who had worked with Dudgeon opined that this view was incorrect. In 1955 Joe Wrigley, during a discussion on vaginal cytology held at the Royal Society of Medicine, felt obliged to set the record straight:

> The cytological examination of sputum, urine and other secretions of the body for the presence of cancer cells, has been practised now for at least thirty years. As early as 1927 the late Professor L. S. Dudgeon and C. V. Patrick published a description of their work … In 1932, under the inspiration and supervision of Dudgeon, the method of cytological examination was extended to gynaecology … I mention this because it is widely and inaccurately assumed that the whole credit for the initiation of cytological investigations in the diagnosis of malignant disease originated from the Northern Continent of America.[53]

Nevertheless, the fact remains that no one in Britain had thought of using the wet film for screening until British gynaecologists were forced to take notice of the Pap smear. Foster and Pinniger, writing in 1963, claimed that the technique had failed to gain wider support because Dudgeon had not been a good propagandist for his work. Although he had launched his technique in the clinical field before Papanicolaou, they argued, his 'insular attitude' towards pathological activities in other centres had resulted in a delay in the spread of its application elsewhere. But there were no doubt more formidable obstacles to the further development of the method than Dudgeon's alleged 'insularity'. According to Wrigley, these were

> fairly obvious because the obtaining of the specimens, their interpretation by the cytologist, and the methodical recording of results, necessitated a team of workers who were prepared to devote a considerable amount of time to these initial investigations. In addition, it was soon discovered that not every pathologist was a cytologist, and that accurate and knowledgeable observers of the changes in cell structure were few, very few, and far between and that their training was likely to be lengthy and arduous.[54]

The piecemeal arrangements for cytological work in Britain could not rival the funding and effort devoted to the study of exfoliative cytology in the United States, particularly in the field of gynaecology. In the years during and immediately following the Second World War, American voluntary agencies and the public health services allocated considerable resources to the development of the Pap smear as a screening tool. Much of this enthusiasm can be attributed to the importance of disease screening in America as a method of delivering preventive healthcare.

'Screening' for Disease in America

Although a large literature has accumulated since the late 1980s on the sociology and history of screening for disease, the concept of 'screening' itself has received relatively little attention.[55] The origins of the term in medieval Europe illustrate its beginnings as the act of protecting or sheltering with a screen (from heat, wind, etc.). Another meaning of 'screening' links the term with the idea of displaying images on a screen (as in shadow puppet theatre): thus when X-rays were introduced in the late nineteenth century, the term 'screening' began to be applied to the patients undergoing X-ray examination. The third meaning of the term alludes to the process of sifting out fine particles by means of a sieve or screen. Methods for sorting larger particles from smaller ones have long been in use in industry and agriculture, and in the late nineteenth century the term 'screening' gained wide currency in the public health field to describe the removal of offensive particles from rivers by use of screens.[56]

It was precisely in this sense that the term 'screening' was first used in early twentieth-century America to describe a form of physical examination, widely used in schools to monitor the health of schoolchildren. As is well known, concerns about the health of the schoolchild in early twentieth-century Europe and America served to stimulate the establishment of systems for the medical surveillance of schoolchildren.[57] The most famous and influential of these was the one instituted in the German city of Wiesbaden.[58] The Wiesbaden system provided for a careful and thorough medical examination of each child on entering school, and for a re-examination in the third, fifth and eighth years of the school course. The chief characteristic of the method lay in its emphasis on the hygiene of the child. The purpose was to identify the children who should be placed under permanent medical supervision: children deemed to be of a weak constitution were required to report regularly to the school doctor until their health improved. School doctors were also expected to visit schools fortnightly to inspect the school grounds and give each pupil a superficial examination in order to rule out the presence of infectious and contagious diseases. They were not allowed to treat children, but they were expected to examine children at home under certain circumstances.

The system of inspection introduced in New York and in other American towns differed from the Wiesbaden method in significant ways. In the United States the main aim was to prevent the spread of infectious and contagious disease, and the doctor was expected to visit the schools every day rather than every two weeks. The initial examination was carried out by the teacher or school nurse when the children arrived. Any child who appeared to be unwell was placed in a special room and given a detailed examination by the medical inspector. As in Germany, school doctors did not treat children: their role was limited to notifying parents and recommending treatment. Comprehensive physical examination for the detection of non-contagious defects was comparatively rare in the United States, but partial examinations to assess the hearing and eyesight of schoolchildren were undertaken in a number of cities. Here too, it was the teacher or nurse who was usually expected to do the initial testing, and to refer any defective child to the school physician.

In 1925 child health expert Merrill Champion introduced the term 'screening' to distinguish this preliminary selective testing from the comprehensive physical examination usually given by the paediatrician to a child coming to his or her office for the first time. In contrast to the full paediatric examination, the screening examination was not diagnostic: it merely aimed to establish the *presumption* of health or disease.[59] The main appeal of the system from the point of view of doctors and public health administrators was that screening saved physician time. It was thus less costly and, as there weren't enough specialists to carry out all the required examinations, it made efficient use of scarce resources. But screening also fulfilled another purpose: it was a means for the public health authorities to demonstrate their commitment to the health of schoolchildren, without infringing on the rights of parents, or on those of private practitioners. This was an important point for a movement of American public health physicians who were seeking to expand the remit of the public health department.

In both Britain and the United States, the establishment of school health services marked a redefinition of the scope of public health, and an important stage in the erosion of the boundaries between curative and preventive medicine. In Britain a comprehensive school medical service was in place by 1914, with school clinics providing the necessary treatment facilities. Local doctors initially viewed the clinics as a threat to their income, but medical opposition later diminished as fears of competition proved unfounded.[60] In the United States, on the other hand, attempts to provide publicly supported treatment facilities for children were vigorously rebuffed by private physicians.[61] Doctors had no objection to public health activities that were complementary to their own, but they strenuously opposed those that seemed to be in competition.

The institution of screening examinations can thus be seen as a means of defusing the tensions between public health and private medicine, by demarcating the field of 'clinical diagnostic activity' from that of 'public health case finding'.

From the late 1930s onwards, screening was extended from schoolchildren to the adult population. Publicly funded programmes were first launched for the control of syphilis and TB; during the war, two tests were designed to screen for mental illness among army recruits.[62] The big push for screening in the United States occurred, however, after the end of the war, as the focus of screening shifted from communicable to non-communicable diseases such as diabetes, cancer, heart disease and glaucoma.[63] This change of targets was prompted by the emergence of 'chronic disease' as a major health policy issue.

Earlier in the century concerns about the apparent rise of degenerative, unpreventable diseases like cancer (unpreventable from the point of view of causes) had led insurance companies, businesses and public health agencies to promote periodic health examinations by the physician as a means of uncovering hidden conditions before they became untreatable. Historian George Weisz has shown how in the interwar period the idea of periodic physical examinations became an essential element of several wider movements, including efforts to expand the scope of public health activities. Leading public health commentators promoted periodical examinations as a new form of prevention that differed markedly from traditional public health interventions, bringing public health activities into contact with traditional medical practice. Periodical examinations, however, proved expensive, time-consuming, and unpopular with both patients and practitioners. Thus in the post-war era, public health efforts to take on chronic disease focused on the promotion of screening. As new tests were introduced to screen for an ever-widening range of chronic diseases, multi-phasic screening programmes were implemented as a cost-effective, efficient alternative to the periodical examination.[64] According to W. G. Smillie, Professor of Preventive Medicine at Cornell University, mass screening for chronic disease was 'an opportunity for the health department to demonstrate its value and effectiveness … it [is] quite appropriate that the official health service should devise procedures which will aid in the early diagnosis of disease and thus lead to the health promotion of the people'.[65]

Public health experts and government agencies continued to advocate screening as a means of finding cases for the private physician. In 'Building

America's Health', the report published in 1952 by the President's Commission on the Health Needs of the Nation, multiple screening programmes were said to 'enhance the patient–physician relationship through encouraging a substantial number of people to seek the attention of their physician because they have some positive test result'.[66] Despite such blandishments, many doctors were alarmed by the development of multiple screening programmes: in the early 1950s some members of organized medicine condemned multi-phasic screening on the grounds that it took the practice of medicine out of the doctor's private office, placing a government agency between the physician and his patient.[67] Public health experts themselves attacked multiple screening as 'slipshod, short-cut medicine'.[68] Nevertheless, multi-phasic programmes proliferated in the 1950s, in the belief that screening could provide an efficient means of alleviating the burden of chronic disease.

The Vaginal Smear: From Diagnostic to Screening Test

It is against this background that we must now consider the development of the Pap smear.[69] Supported first by departmental funds, and subsequently by a grant from the Commonwealth Trust, Papanicolaou and Traut initially sought to establish the validity of the test by studying over 10,000 smears taken from 3000 women. In a landmark paper published in 1941, Papanicolaou and Traut announced that they had identified cancer cells in a number of patients with malignant tumours of the uterine cervix and endometrium, and in some women who had not been suspected clinically. The paper was followed in 1943 by the publication of an illustrated monograph, which served to bring the method to the attention of a wider medical and scientific community.[70]

The established diagnostic method for cancer was the biopsy, and it was against this standard that the vaginal smear was evaluated. The research showed, however, that the method could not become an alternative to the biopsy, since the interpretation of the slides was subject to 'some fallacious deductions'. Papanicolaou and Traut thus emphasized that the test should be followed by a confirmatory biopsy in all cases where a 'presumptive diagnosis' of malignancy was made. What, then, could its value be to the patient and the practitioner? Papanicolaou and Traut claimed that the test did have a number of advantages over the biopsy. First, it was simple and inexpensive, so it could be used to examine a larger number of women. Second, it could reveal the presence of cancer when it could not be demonstrated by any other means. Third, it could be made without trauma to the parts, thus avoiding the danger of disseminating cancer cells. Papanicolaou and Traut concluded that the vaginal smear was valuable as a 'preliminary or sorting procedure'.

The first independent evaluation of the method was undertaken by Boston gynaecologist Joe Meigs and his collaborators Ruth Graham, Maurice Fremont-Smith, Israel Kapnick and Rulon Rawson. Their report, published in 1943, supported the use of the vaginal smear as an adjunct to diagnosis.[71] It was in this paper that the vaginal smear was first described as a 'screening' test, to underline the fact that its application was only the first step in the diagnostic work-up of uterine cancer: according to Meigs and colleagues, the vaginal smear was 'comparable to tuberculin testing of college students for tuberculosis, who are thereby screened, chest x-ray films being indicated only in the positive reactors'.[72] Meigs and his associates recommended that the test be incorporated into every routine gynaecological examination, and they suggested that state cancer diagnostic laboratories should offer a vaginal smear diagnostic service to all the physicians in the community.

In response to this suggestion, in January 1945 the Massachusetts Public Health Department launched the first long-range study to determine whether the test was of sufficient value to warrant its use, *either* as an aid to diagnosis for all gynaecological cases, *or* as a screening method to detect symptomless carcinoma. The project built on the long tradition of publicly supported work against cancer in the Bay State. In 1926, as a result of pressure from the state legislature, the Massachusetts Department of Public Health had begun to take an active role in the provision of cancer care facilities. A network of state-aided cancer clinics was established, and a hospital for patients needing long-term care was created at Pondville – the first state-operated cancer hospital in America.[73] At the same time, a young statistician, Herbert Lombard, was brought into the public health department to do studies on the epidemiology of cancer. As Weisz describes, these developments met with opposition from the commissioner of public health, Eugene Kelley, who viewed the provision of cancer facilities as the province of physicians and hospitals. Kelley's successor, George Bigelow, took a different approach. Not only did he argue that cancer was a public health concern; with Lombard's support, he also managed to link cancer with wider concerns about chronic disease, setting the premises for the extension of public health activities to other conditions labelled as ‘chronic’.[74] The vaginal smear study, which began in the mid-1940s with Lombard as the lead investigator, thus had significance well beyond its ostensible aims.

Funded by the Commonwealth Trust, the study tested 3586 women who attended the state’s cancer clinics and hospitals. The initial results were not impressive. The report of the investigation, published in 1948, cast serious doubts on the view that testing asymptomatic women would significantly reduce cervical cancer mortality. The authors of the report estimated that only *one* case of uterine cancer among 200–500 symptomless women could be found by the method. They concluded that the vaginal smear was more likely to lower cancer mortality by increasing physicians’ awareness of early signs and symptoms, than by disclosing a large number of early cases.[75] A smaller study carried out at the Boston City Hospital in the mid-1940s was more upbeat, although it similarly revealed disappointingly low yields of uterine carcinoma in asymptomatic women.[76] Among clinicians there were instances when the utilization of the vaginal smear was supported not because of its direct contribution to detection of early cancer, but because of its indirect contribution as an educational tool.[77] Despite its limitations, the method attracted the attention of two interested parties which endeavoured to make the vaginal smear into the ‘right’ tool for the job of screening: the American Society for the Control of Cancer (ASCC) and the National Cancer Institute (NCI).

The ASCC began to champion the technique after its reorganization in 1945, when it was renamed the American Cancer Society (ACS). Under the energetic direction of Mary Lasker, the ACS was brought into the modern world of salesmanship and fund-raising. Lasker brought in business people, including advertising expert Emerson Foote, who aggressively directed the society’s drive for funds. The vaginal smear gave the society an opportunity to keep cancer highly visible and raise its own public profile. Encouraged by its new medical and scientific director, Charles Cameron, in 1946 the ACS began to support Papanicolaou’s research. In 1948 the society sponsored the First National Cytology Conference to promote a wider discussion about cervical cytology; it subsequently offered clinical fellowships in exfoliative cytology to physicians trained in pathology. During the 1950s the ACS cooperated in the first mass screening demonstration project carried out by the NCI in Memphis and Shelby County, Tennessee.[78] It also used funds from its vastly increased budget to support the extension of hospital and laboratory facilities for screening.

In 1951 it promoted the formation of an interdisciplinary society for the study of cytology, the Inter-Society Cytology Council, later known as the American Society of Cytopathology.

The NCI was created in 1937 as a New Deal programme, with the dual aim of promoting research into the causes and cure of cancer, and of helping indigent patients suffering with cancer. A reorganization of its activities in 1947 led to the establishment of an administratively separate Cancer Control Branch to develop prevention and control activities. After carrying out a preliminary study of the vaginal smear at Hot Springs, Arkansas, in 1947, the Branch turned its attention to demonstrating the application of cytology to cancer control in large population groups.[79] The first large-scale demonstration was established in 1952 in Memphis-Shelby County, in collaboration with the University of Tennessee. As well as funding the Memphis study, the Cancer Control Branch of the NCI sponsored private physician-based projects in other cities to evaluate the feasibility of vaginal cytology, and to assess the incidence of genital tract cancers in different population groups.[80] The NCI also provided both personnel and financial support for data management at a number of locations around the country.

The ACS's efforts to disseminate the Pap smear were more than amply rewarded. In the late 1940s the lay press picked up the story: 'The message of hope', announced the October 1947 issue of the *Woman's Home Companion*. The article asserted that the new method was 'inexpensive, painless and at least 97 per cent accurate', and that if put into general use it would 'almost wipe out this form of cancer'.[81] No mention was made of the fact that a positive smear required confirmation by cervical biopsy or resection, and/or by curettage of the uterine cavity. Stimulated by sensational press reports, public demand for the test soared in the late 1940s, forcing many gynaecologists to incorporate the test into their routine gynaecological examinations. An article published in 1957 remarked on the mismatch between public demand for the smear test and the facilities and manpower to provide the service: 'Cytologic diagnosis of uterine cancer has recently gained the attention of many lay magazine and newspaper editors, resulting in a public demand for something which the medical profession is not ready to provide.'[82]

During the 1950s the efforts of the ACS and of the NCI were thus directed towards creating the infrastructure that was necessary for routine mass screening. A new class of worker, the cytotechnician, was created to perform the tedious and time-consuming job of screening, under the supervision of the pathologist.[83] This division of labour was gendered, as cytotechnicians were mostly female, while pathologists were mostly male. Other innovations were introduced in the 1950s and 1960s to improve the accuracy of the test, speed up results, and reduce costs, including the use of Ayre's wooden spatula to replace Papanicolaou's original pipette.

The Pap smear flourished in mid twentieth-century America not only because it served the interests of the ACS, the NCI and the American Public Health Service (PHS). In a system of medical care based on fee-for-service contracts, screening was a marketable and profitable activity. It brought business to cytologists, clinicians and clerical workers. It stimulated the growth of a commercial enterprise which included not only the promotion and performance of the procedures, but also the supply of equipment and reagents. The desire to avoid missed cases led to overdiagnosis and overtreatment, the introduction of another screening device, the colposcope, and calls for more women to be tested. Yet despite escalating screening costs, debates about the significance of cytological findings, and concerns over excessive hysterectomies, American clinicians, politicians, voluntary agencies and the public health service remained optimistic about the potential of screening programmes to reduce mortality and morbidity.

British Attitudes to Screening

Turning now to Britain, we can now see how different the situation was as compared with the United States. Public awareness of cancer was as great as in the United States, but the response was quite different. First, there was hardly any support for periodical examinations. Preventive checks for expectant mothers and schoolchildren were instituted in the early twentieth century under the aegis of local public health departments, but apart from isolated examples of occupational checks, and the routine enquiries of insurance companies, regular checks of 'well persons' were extremely rare in Britain during the first half of the twentieth century.[84] The dominant approach to cancer control was to improve healthcare providers' ability to pick up symptomatic cases. But Britain lacked the extensive network of free cancer detection clinics established in America by voluntary organizations and the public health service. The burden of carrying out health checks on the apparently well thus fell to general practitioners, who were already busy enough looking after the sick. As a County Medical Officer put it in 1965, 'the time of doctors is too valuable to waste on examining the transparently hale and hearty when there is an unfailing supply of those who are sick'.[85] Mass screening for TB was introduced in the armed forces at the beginning of the Second World War, and in 1943 the Ministry of Health launched a scheme for the detection of early cases among selected groups.[86] By 1948, over three million people had been X-rayed. However, mass screening was not regarded as the main plank of the government's response to TB. The prevailing view was that screening was not a particularly valuable way of using scarce X-ray equipment, as more cases were recorded through ordinary GP contact than through screening.[87] Furthermore, as Weisz notes, in contrast to the United States, chronic disease in Britain was associated with the elderly population; as such, it was largely ignored. The attitude of British patients to preventive check-ups can be summed up in seven words: 'if it ain't broke, don't fix it'. The majority of people in Britain believed that it was best to steer clear from unnecessary and potentially meddlesome investigations, if there was nothing obviously wrong with their health. This lack of public pressure for regular screening services, except from some middle-class groups, continued well into the 1970s.

When the Pap smear was introduced into Britain during the late 1940s, very few gynaecologists advocated the method as a tool for population-based mass screening. The prevailing view was that the number of pre-cancers detected by the smear test was too small to justify the considerable outlay of resources needed to roll out a mass screening programme. Even Malcolm Donaldson, who had long been an advocate for periodical examinations, doubted the value of the Pap smear as a preventive method. At a conference held in Toronto in 1955, Donaldson asserted that education of the public in the recognition of symptoms was a better line of approach than screening, 'because the small numbers of unsuspected cancers discovered by the latter method did not justify the expenditure of the relatively enormous amount of time by doctors and technicians'.[88]

In the United States, concerns over the effectiveness and expense of subsidized cancer clinics prompted the ACS and the public health service to encourage the development of GP-based screening programmes: the costs of screening could then be passed on to the women who went for the test. During the 1950s the ACS tried to convince generalists that cancer detection was economically viable, and in 1964 the PHS and the American Academy of General Practice (AAGP) enlisted the cooperation of generalists by establishing the so-called 'Office Detected Cervical Cancer Program'. According to Lewis Robbins, the first chief of cancer control for the PHS, the scheme was a resounding success: between 1964 and

1969, when the programme was terminated, 1.7 million Pap smears were taken, and 4000 cancers detected, at very low cost to the government.[89]

In Britain concerns about the economic costs of screening were framed instead in the context of a tax-based national health service, which was proving to be far more expensive than initially anticipated. In the early 1950s the British NHS was already facing a crisis of expenditure, forcing the government to introduce charges for prescriptions, dental treatment and eye tests. Limited budgets for health and the need to balance competing priorities did not favour the introduction of screening programmes for cervical cancer. Gynaecologist A. H. Charles summed up the prevailing view in an article published in 1952:

> To make the method available to women in all the large centres of the British Isles and to persuade women to avail themselves of these facilities seems on contemplation to be an insuperable task in the present state of economy. It is questionable whether the incidence of uterine cancer is sufficiently high to warrant the enormous expenditure which would be involved in the setting up of such centres, when one considers the rival claim of clinics urgently needed to combat highly prevalent diseases, such as pulmonary tuberculosis.[90]

The political decision to invest large amounts of public money in a healthcare service largely defined the issue in the 1950s. The British were happy to use the vaginal smear on women who turned up at VD clinics or in hospital out-patient departments, but they did not think that much could be gained by actively looking out for cases.

During the 1960s the attention focused on the effect of screening on cervical cancer mortality. In 1962 a study of cervical mortality trends in British Columbia, Canada, concluded that the incidence of clinically invasive squamous carcinoma had fallen by 30.5 per cent following the introduction of cytological screening in the Province.[91] Based on the controversial assumption that CIS inevitably progressed to invasive cancer, the British Columbian data drew criticism from a number of British epidemiologists. Critics questioned the belief that CIS advanced to cancer if left untreated; they also found no evidence that the reduction in mortality from cervical cancer in British Columbia was greater than elsewhere in Canada.[92] In the United States, an analysis of ACS data showed that the death rate of cervical cancer had decreased at a nearly uniform rate from 1930 (mirroring the decline in the UK). The author of the study noted that the decreasing trend in mortality of cervical cancer nearly paralleled the decline of the stomach cancer death rate, for which no one took any particular credit.[93] Nevertheless, the British Columbian study aroused the interest of the British lay press. After an intense media and grassroots campaign led by the MWF, women's organizations and other interested parties, in 1966 the British government made cervical cancer screening available under the NHS. Screening programmes were initiated first on a regional basis, and in 1988 a national cervical screening programme was established. Together with the breast screening programme, the cervical cancer programme now stands in Britain as a symbol of the nation's commitment to prevention and women's health, even though a persistent minority still questions its success, and coverage statistics show that an equally persistent proportion of women invited for screening never participate in it.

Notes

1. Novak, 'Pseudomalignant and Precancerous Lesions of the Cervix'.
2. Emmert, 'The Recognition of Cancer of the Uterus'. Emmert is credited with introducing colposcopy into the United States in the early 1930s.
3. Ayre, 'Cervical Cytology', p. 513.
4. The term 'pre-cancerous' was also applied in gynaecology to chronic irritative and inflammatory conditions which, though benign in themselves, were believed to *predispose* to cancer. Pre-cancerous lesions were understood as possible *precursors* of the disease.
5. Martzloff, 'Cancer of the Cervix Uteri', p. 1923.
6. On cervical cancer screening, see Löwy, *Preventive Strikes*, pp. 118–42; Löwy, 'Cancer, Women, and Public Health'. On the Pap smear, Vayena, 'Cancer Detectors'; Gardner, *Early Detection,* pp. 122–3. For a sociological critique, see Casper and Clarke, 'Making the Pap Smear into the "Right Tool" for the Job'. This much-cited article elaborates arguments first proposed by epidemiologists Foltz and Kelsey in 1978; Foltz and Kelsey, 'The Annual Pap Test'. On colposcopy, Teixeira and Löwy, 'Imperfect Tools for a Difficult Job'; Eraso, 'Migrating Techniques'.
7. Eraso, 'Migrating Techniques', p. 34.
8. Williams, *On Cancer of the Uterus*, p. 12.

9. Koss, 'Schauenstein's Contribution'.
10. Pronai, 'Zur Lehre von der Histogenese und dem Wachstum des Uteruskarzinoms'; Rubin, 'Pathological Diagnosis of Incipient Carcinoma of Uterus'.
11. Rubin, 'Pathological Diagnosis', p. 676.
12. Schottländer and Kermauner, *Zur Kenntnis des Uteruskarzinoms*; Broders, 'Carcinoma in Situ Contrasted with Benign Penetrating Epithelioma'.
13. Schiller, 'The Diagnosis of Carcinoma of the Cervix in a Very Early Stage'.
14. There is some confusion regarding the type of iodine solution advised by Schiller. In his original communication he referred to Lugol's solution. American workers inferred that it was Lugol's solution as defined in the US pharmacopoeia (compound solution of iodine U.S.P.). Schiller's reference, however, was to Lugol's solution as used for bacterial stains, which is equivalent to Gram's solution in the United States. See Martzloff, 'Cancer of the Cervix Uteri', fn. 4 p. 1923.
15. See e.g. Percival, 'Carcinoma of the Cervix'; Meigs and Dresser, 'Carcinoma of the Cervix', p. 653; MacLeod, 'Carcinoma of the Uterus', p. 142.
16. Macfarlane, Sturgis and Fetterman, 'The Value of Periodic Pelvic Examinations', p. 878; L'Esperance, 'The Early Diagnosis of Cancer', p. 400.
17. Martzloff, 'Cancer of the Cervix', p. 1923.
18. Novak, 'Cancer of the Uterus', p. 201. On the diffusion of the biopsy for the diagnosis of borderline lesions of the breast, see Löwy, *Preventive Strikes*, pp. 31–5.
19. Fusco *et al.*, 'History of Colposcopy'.
20. Burghardt, Pickel and Girardi, *Colposcopy, Cervical Pathology*, p. 5.
21. Proctor, *The Nazi War on Cancer*, p. 33.
22. Ibid.
23. Ibid., p. 32.
24. Teixeira and Löwy, 'Imperfect Tools for a Difficult Job'; Eraso, 'Migrating Techniques'.
25. Torres and Riopelle, 'History of Colposcopy in the United States'.
26. Norris, 'The Diagnosis of Early Carcinoma of the Cervix', p. 296.
27. Strachan, 'Precancerous Cervix', p. 635; Strachan, 'Precancerous Changes in the Cervix Uteri', p. 574. On Fletcher Shaw and the

colposcope, see James Andrew's contribution in Reynolds and Tansey, *History of Cervical Cancer and the Role of the Human Papillomavirus*, p. 27.

28. Andrew, 'The Colposcopic Diagnosis of Early Cervical Carcinoma'.
29. Strachan, 'Precancerous Cervix', p. 635.
30. See e.g. Gellhorn, 'The Uses of Colposcopy'; Martzloff, 'Cancer of the Cervix'; O'Donnell, Venet and Day, 'Progress in Cancer Detection', p. 201.
31. This is the reason why in one of the first screening trials carried out in Memphis in the 1950s, the pipette method was used on indigent patients instead of Ayre's scraping technique, which involved the use of the speculum. In the Memphis trial a nurse was responsible for taking the smears of indigent examinees. 'Interview with John Dunn, April 1, 1976', *History of Cancer Control in the United States*, p. 35. See also Dunn and Sprunt, 'Uterine Cancer Case Finding'.
32. The pioneer in the United States was the Los Angeles gynaecologist Duane Townsend.
33. On Wirths, see Lifton, *The Nazi Doctors*, pp. 384–414.
34. Eraso, 'Migrating Techniques', pp. 33–51.
35. Bland-Sutton, *Tumours Innocent and Malignant*, p. 258.
36. Spriggs, 'History of Cytodiagnosis'.
37. For a biography of Papanicolaou, see Carmichael, *The Pap Smear*.
38. Papanicolaou, 'The Diagnosis of Early Human Pregnancy'.
39. Papanicolaou, 'New Cancer Diagnosis'; paper originally presented at the Third Race Betterment Conference, Battle Creek, Michigan, 2–6 January 1928, and published in the Proceedings of the Conference the same year.
40. Eisenhardt and Cushing, 'Diagnosis of Intracranial Tumours by Supravital Technique'. Supravital staining is a procedure in which living tissue is removed from the body and cells are placed in a non-toxic dye solution so that their vital processes may be studied. Sabin, the renowned histologist and public health expert, had learnt the technique during one of her frequent trips to Germany.
41. Bamforth, 'Pioneer Work by Professor Dudgeon in Cytological Diagnosis', p. 395; Foster and Pinniger, 'History of Pathology at St Thomas's Hospital, London', p. 342.
42. Dudgeon and Jewsbury, 'The Bacteriology of Human Milk'.

43. Foster and Pinniger, ‘History of Pathology at St Thomas’s Hospital, London’, p. 342. See also Prüll, ‘Disease of Cells or Disease of Patients?’
44. Dudgeon and Patrick, ‘A New Method for the Rapid Microscopical Diagnosis of Tumours’; Dudgeon and Barrett, ‘The Examination of Fresh Tissues by the Wet-Film Method’. Barrett became famous for his work on the abnormalities of the oesophagus.
45. Tasca, Ostor and Babeş, ‘History of Gynecologic Pathology XII: Aurel Babeş’.
46. Babeş, ‘Diagnostic du cancer du col utérin par les frottis’. Babeş briefly returned to the subject in 1931, but he subsequently abandoned his researches to pursue other interests. It was not until after the establishment of the Pap smear that his contribution was rediscovered. Babeş, ‘Sur le cancer superficiel du col utérin’. On the ‘rediscovery’ of Babeş, see Wied, ‘Pap Test or Babes Method?’
47. Douglass, ‘Odorico Viana and his Contribution to Diagnostic Cytology’.
48. Dudgeon and Barrett, ‘Examination of Fresh Tissues’, p. 9.
49. Wrigley, ‘Method of Rapid Diagnosis of Pathological Specimens’; Bowes and Barrett, ‘Use of Vital Staining and Wet Films in the Diagnosis of Lesions of the Cervix’.
50. Philps, ‘The Identification of Carcinoma Cells in the Sputum’.
51. Brudenell, ‘Value of Cytology in the Early Diagnosis of Carcinoma of the Cervix’, p. 380.
52. Anderson, ‘The Management of the Cytology Test’, p. 239.
53. ‘Section of Obstetrics and Gynaecology: Discussion on the Value of Vaginal Cytology’.
54. Ibid., p. 248.
55. On the genealogy of screening, see Reiser, ‘The Emergence of the Concept of Screening for Disease’; Armstrong, ‘Screening: Mapping Medicine’s Temporal Spaces’. See also Towers, ‘Policy and Politics: Historical Perspectives on Screening’; Morabia and Zhang, ‘History of Medical Screening: from Concepts to Action’; Raffle and Gray, *Screening: Evidence and Practice*.
56. See e.g. Soper, ‘Rational Basis for the Sanitation of Rivers and Harbors’. Armstrong argues that the use of the term ‘screening’ to denote the process of examining ‘normal’ populations for latent disease derives from early attempts to track TB in the population,

using X-ray screening. He proposes that the X-ray and the sieve derivations of 'screening' coalesced when mass radiography programmes for TB were instituted in the early 1940s. Armstrong no doubt refers to the introduction of chest photofluorography in the late 1930s, a method also called 'screen photography' or 'mass miniature radiography' (MMR). I want to argue that chest photofluorography was a screening device not because it used X-ray imaging, but because it was a diagnostic 'sifter'. Radiologists emphasized that abnormal MMR findings should always be confirmed by a full chest X-ray. See e.g. Ellman, 'Mass Radiography'.

57. There is a large literature on the development of school medical services in various countries. On the development of school medical services in England, see e.g. Harris, *The Health of the Schoolchild*; Hirst, 'Growth of Treatment'.
58. For a detailed description, see Gulick and Ayres, *Medical Inspection of Schools*, pp. 19–20.
59. Champion, 'Should the Health Examination be a Screening or a Diagnosis?'
60. See Hirst, 'Growth of Treatment'. By the terms of the Education Act of 1918, local authorities were, however, banned from providing domiciliary care for schoolchildren. The 1918 Maternity and Child Welfare Act imposed similar restrictions with regard to the care of pregnant women and mothers. See Honigsbaum, *The Division in British Medicine*, pp. 45–6.
61. Starr, *The Social Transformation of American Medicine*, esp. Chapter 5.
62. Morabia and Zhang, 'History of Medical Screening', p. 464.
63. On the concept of chronic disease, see Weisz, *Chronic Disease in the Twentieth Century*; Timmermann, 'Chronic Illness and Disease History'.
64. See e.g. Mountin, 'Multiple Screening and Specialized Programs'; Breslow, 'Multiphasic Screening Examinations'; Chapman, 'The Concept of Multiphasic Screening'. American public health expert Lesley Breslow estimated in 1959 that a 50 per cent increase in the workload of the general physicians of the country would have been required in order to carry out a periodic health examination programme for the whole population; Breslow, 'V. Periodic Health Examinations and Multiple Screening'.
65. Smillie, 'Multiple Screening'.

66. Quoted in Breslow, ‘Periodic Health Examinations’, p. 1152.
67. Ibid.
68. Smillie, ‘Multiple Screening’, p. 256.
69. Quoted in Carmichael, *The Pap Smear*, p. 68.
70. Papanicolaou and Traut, ‘The Diagnostic Value of Vaginal Smears’; Traut and Papanicolaou, *Diagnosis of Uterine Cancer*.
71. Meigs *et al.*, ‘The Value of the Vaginal Smear’.
72. Ibid., p. 461.
73. Patterson, *The Dread Disease*, pp. 118–19; Lombard, ‘Twenty Years of Cancer Control in Massachusetts’.
74. Weisz, *Chronic Disease*, pp. 49–53. Lombard was later to become director of the division of cancer and other chronic diseases in the Massachusetts Department of Public Health.
75. Lombard *et al.*, ‘Use of Vaginal Smear as a Screening Test’, p. 321.
76. McSweeney and McKay, ‘Uterine Cancer’.
77. See e.g. Kernodle *et al.* ‘Diagnosis of Genital Malignancy by Vaginal Smears’, p. 1088.
78. Dunn and Sprunt, ‘Uterine Cancer Case Finding by Vaginal Cytology’.
79. On the Hot Springs programmes, see Koplin, ‘Objectives and Program of the Arkansas Cancer Detection Project’.
80. For a list of the projects established in the 1950s and early 1960s, see *History of Cancer Control in US*, vol. 1, p. 231.
81. Quoted in ‘The Papanicolaou Test for Uterine Cancer’.
82. King, ‘The Uterine-Cytology Program of the American Cancer Society’, p. 136.
83. As Casper and Clarke note, the gendered division of labour extended to ‘personal qualifications’ as well. Cytologists were expected to show evidence of academic achievement, and special training and interest in cytology. For the cytotechnician, stamina, a high sense of responsibility, and strong attention to detail, were deemed to be more important than a higher academic qualification; Casper and Clarke, ‘Making the Pap Smear into the “Right Tool” for the Job’, pp. 268–70. The feminization of screening was also a feature of the development of cytology in Britain. When a National Cervical Cancer Campaign was launched in 1965, activists tapped into the large pool of married women with children to recruit cytotechnicians. Both the Association for the Improvement in Maternity Services (AIMS) and the Register of Qualified Married

Women offered their help with the recruitment drive; Reynolds and Tansey, *History of Cervical Cancer*, pp. 21–3.

84. Raffle and Gray, *Screening: Evidence and Practice*, pp. 11–18.
85. Elliott, 'The Prevention of Illness in Middle Age', p. 324.
86. See Bryder, *Below the Magic Mountain*, pp. 227–39.
87. Levitt, 'TB, Glasgow and the Mass Radiography Campaign in the Nineteen Fifties', p. 6.
88. Donaldson, 'Cancer Education'.
89. Robbins, 'Letter to L. Breslow, 9 March 1977', *History of Cancer Control in the United States*, Appendix 13.
90. Charles, 'Cancer of the Uterine Cervix', p. 229.
91. Boyes, Fidler and Lock, 'Significance of In Situ Carcinoma'.
92. Ahluwalia and Doll, 'Mortality from Cancer of the Cervix Uteri'; Knox, 'Cervical Cytology'; Cochrane and Holland, 'Validation of Screening Procedures'.
93. Bryder, 'Debates about Cervical Screening', p. 285.

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CHAPTER 7

Managing Cancer Risk: The Role of Prophylactic Surgery

In 1904 leading London surgeon Mayo Robson suggested that

> a general acceptance of the view that cancer has usually a pre-cancerous stage, and that this stage is one in which operation ought to be performed, would be the means of saving many useful lives, for it would lead to the removal of all suspicious epithelial conditions before the onset of cancer.[1]

Robson linked eczema of the nipple and chronic mastitis with breast cancer; gallstones with cancer of the gall-bladder and liver; stomach ulcer with gastric cancer; haemorrhoids and ulcers of the rectum with rectal cancer.[2] In 1914 the American surgeon William Rodman argued that precancerous conditions demanded 'a more radical treatment than has hitherto been accorded them … Prompt and efficient means, entirely within our reach, nearly always either cure incipient carcinomata or, what is still more desirable, prevent them.'[3]

This chapter picks up the theme of prevention through a discussion of the role of surgery in the prevention of gynaecological cancer. It aims to contextualize prophylactic surgery on women by locating it within the long and chequered history of surgery to prevent disease. History shows that the popularity of surgery as a measure to prevent cancer in various body sites has varied across cultures and historical times. This raises questions about attitudes to the body at risk: we need to ask what makes it

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possible to contemplate the removal of organs 'just in case'. As we can see in this chapter, the perception that some surgical operations are 'mutilating' has played a key role in medical assessments of the risks and benefits of preventive approaches based on surgery.

A Stitch in Time

In an address on surgery, delivered in 1896 at the BMA's annual meeting, Scottish surgeon Roderick Maclaren described preventive surgery as 'a product of modern times, the outcome of recent advances in the knowledge of the intimate causes of disease, of the introduction of anaesthetics, and of perfected methods of wound treatment'.[4] Maclaren mapped out a wide field. Excision of enlarged tonsils and adenoids to prevent stunted growth in children; radical hernia operations to prevent death from injury and strangulation; prostatectomy to eliminate the danger of urinary tract infections; removal of the appendix after an inflammatory attack to avert the risk of peritonitis.[5] Preventive surgery could thus mean 'surgery to prevent surgery': an early operation now saved tissue from excision later. It could also mean 'surgery to conserve health': treatment of asymptomatic or mildly symptomatic individuals prevented subsequent disease, disability and even death.[6] According to Maclaren, cancer was 'an almost undeveloped region' as far as preventive surgery was concerned. The study of its antecedents suggested that much could be done to prevent it by treating irritative conditions before they became cancerous: 'The recent developments of surgery in cancer have been in the direction of extensive operations and wide-reaching removal of tissues', he observed. 'But I think and hope that there is in the future a preventive surgery founded on fuller knowledge, which will anticipate these great operations by small ones, or, it may be, by such preventive measures as will do for cancer what we are steadily doing for so many other diseases – compress it within narrowing limits.'[7]

In the early 1900s the throat and the naso-pharynx became major targets for the surgeon's preventive efforts, as doctors worried that infected tonsils and adenoids might cause disease in distant parts of the body.[8] On both sides of the Atlantic, countless tonsillectomies and adenoidectomies were performed on children for the purpose of preventing infectious disease, or simply to promote good health.[9] By the 1920s, surgeons were recommending the removal of normal appendices whenever the abdomen was opened. Most often than not, the chief 'beneficiaries' of prophylactic surgery were the better off. For example, a study of the incidence of tonsillectomy, published by James Glover in 1938, showed that 20 per cent of state school boys and 83 per cent of new entrants to Eton (arguably Britain's top private school) had been tonsillectomized before the age of fourteen.[10] According to a survey of Royal Air Force recruits during the war, boys at private schools also had a much greater chance of undergoing both appendectomy and circumcision.[11]

Not only did surgery claim a new role in the prevention of disease in the individual. In the early twentieth century, the belief that the human carrier was the greatest agent of disease propagation served to stimulate public health interest in surgery as a strategy for disease control in the community. In the United States, far-sighted health officials enthused about the potential public health benefits of surgery. The most vocal of these was Charles V. Chapin, public health commissioner of Providence, Rhode Island. In *How to Avoid Infection*, a short popular book published in 1917, Chapin asserted that it was 'more important to remove adenoids from the child than it is to remove ashes from the back yard'.[12] While it was still the duty of public health officials to provide pure water, build sewers, supervise the quality of milk and so on, 'personal instruction, medical service and helps to right ways of living' now deserved as much attention.[13] Echoing these sentiments, in 1913 Liverpool physician James Barr emphasized the difficulty of preventing the spread of infectious diseases among children so long as 'overcrowding, defective ventilation, dirt and want of cleanliness in the homes, schools, and public conveyances' remained. However, a great deal could be achieved 'by looking after the children's teeth, by seeing that their teeth and jaws get plenty of exercise in chewing food, by keeping their mouths and nasal passages as aseptic as possible, and by removing any obstructions, such as adenoids and tonsils'.[14] Nowhere was the use of surgery as public health intervention clearer than in the United States, where the removal of the gall-bladder in chronic carriers of typhoid was undertaken in the early 1900s as a means of preventing the spread of the disease.[15] Surgery thus became a form of individualized public health, treating the individual in order to protect the community.

PRIMUM: NON NOCERE

The main problem with surgery is that it introduces new hazards. Surgeons take the knife to flesh and bone. In doing so, they damage that flesh and bone. If they are to comply with the principle that the physician or surgeon should do no harm, the damaged tissue must not constitute harm from a wider perspective that considers not only the effect on the tissue, but also on the patient as a whole.[16] This raises some interesting questions when an operation is done to prevent *probable* disease rather than to treat *actual* disease. Is it justifiable to expose healthy or mildly symptomatic patients to the dangers of surgical intervention? How is a practitioner to determine when doing nothing is better than performing a preventive operation? Prophylactic operations become morally contested when there is doubt about how their benefits weigh up against their harms.

In the late nineteenth century Roderick Maclaren emphasized that more stringent standards of safety apply to preventive operations than to operations of emergency: ‘A preventive operation should be devoid of risk to life both at the time and during the healing stage’, he said. ‘I do not think that we ought to suggest to anyone that for the sake of a future good he should undergo what may kill him at once.’[17] Sixty years later Jonathan Rhoads, the great American surgeon, argued that prophylactic cancer surgery was not a field in which it was easy to justify a hazardous operation: ‘rather it is a field where conservative, carefully planned procedures which can be carried out with relatively low mortality rates have a place’.[18] The rationale for caution hardly needed elaborating: ‘we do not want the war against cancer to become a Punic War, which if you recall was a war which the Romans won at such cost that they had reason to regret having engaged in it’.[19] Rhoads was interested in determining when a preventive operation may be justifiable. This was not an easy task, as one had to balance the probability that a given patient might die from the surgery against the probability that a supposedly pre-cancerous lesion may never turn cancerous. Bearing in mind that the odds of a pre-cancerous condition turning malignant were not the same for all cancers, the calculation of acceptable surgical risk became very complicated indeed.

The other issue raised by prophylactic cancer surgery is whether the excision of tissues and organs to treat probable disease constitutes mutilation (defined as the excision or permanent destruction of a limb or other essential part). When is a prophylactic operation a ‘mutilation’? The answer would seem to be that it is a mutilation if it is seen like that in a specific culture. Take the prophylactic excision of warts and moles, for example. No one has ever suggested that surgery to remove skin blemishes constitutes mutilation. Arguably this is because the practice is widely perceived to have a cosmetic effect as well as a medical rationale. Joseph Bloodgood, the eminent Johns Hopkins surgeon and medical adviser to the American Cancer Society, was fond of saying that he had never seen a beautiful woman in whom cancer of the face had developed. This was because ‘comely women keep the skin clean and oily and pay immediate attention to any defect’.[20] In modern dermatological practice, doctors treat skin disease, and they also treat the skin to improve a patient’s appearance – a legacy of ancient times, when barber-surgeons not only groomed their clients, but also undertook the removal and mitigation of marks and blemishes.

Prophylactic laryngectomy lies at the other end of the spectrum. Writing in 2000, the French oncologist Jean L. Lefebvre observed that ‘as soon as larynx surgeons had at their disposal total laryngectomy for the treatment of larynx cancer, they tried to avoid performing such a mutilating surgery’.[21] Writers about laryngeal cancer in the early twentieth century regularly remarked about the miserable existence of patients who had undergone laryngectomy: deprived of their voice, they were severely handicapped in their social intercourse, and they often found it very hard to obtain a means of livelihood.[22] As cancer of the larynx disproportionately affected men, who were usually the primary breadwinners in the family, the socio-economic repercussions of surgery were particularly severe. Performing a total laryngectomy before cancer actually occurred was thus simply unthinkable. In a paper published in 1923 Chevalier Jackson, the father of American bronchoesophagology, argued that surgical excision had a definite role to play in the treatment of chronic mastitis, a condition widely regarded as pre-cancerous at the time, but not in the management of chronic laryngitis: ‘Laryngectomy leaves the patient in such a deplorably crippled condition’, he said, ‘that we cannot consider for a moment the total removal of an otherwise incurable chronically inflamed larynx only suspected of being potentially cancerous, as has been so wisely urged by Bloodgood in parallel cases of chronic mastitis’.[23] To Jackson’s mind, the loss of normal speech was a much more catastrophic event than the loss of one or both breasts. This view, widely shared by Jackson’s contemporaries, also explains why cancer of the larynx was excluded from the earliest anti-cancer campaigns. It was not until the introduction of radiotherapy that attitudes began to change. Restoration of the voice to a normal or nearly normal state was usually possible after radiotherapy. This made the early detection and treatment of laryngeal cancer a much more attractive proposition.[24]

Doctors have also been reluctant to recommend orchidectomy for the prophylaxis of both testicular and prostate cancer (the latter has been found to be highly dependent on the production of androgens). In modern Western societies the testes is associated with positive values, still engraved in the etymology of the word 'testes', i.e. witness: strength, power, bravery and moral probity. Having 'no balls' means to be powerless and lacking in confidence, while castration is frequently depicted as a humiliating threat to identity. The language of emasculation has affected not only medical attitudes to prophylactic orchidectomy, but also the way in which doctors present chemical and surgical castration for prostate cancer patients. As Wassersug and Lieberman note, the oncological literature avoids terms such as 'castrated', 'emasculated' and 'neutered', using instead the term 'hormonal therapy' to describe androgen-depriving treatments.[25] The invisibility of the emasculated in modern society, critics argue, is a disservice to men. It minimizes the public's understanding of the impact of castration on cancer patients, and it may also inhibit those in need of medical treatment from getting it in an appropriate and timely fashion.

Redundant Organs

In modern times a large number of prophylactic operations have been justified on the grounds that 'functionless' organs are expendable. In the early 1900s practitioners rationalized prophylactic tonsillectomy on the grounds that the tonsils were 'portals of infection', with no clear function in the economy of the organism: according to the American practitioner W. Harry Barnes, for example, the tonsils merely served to 'complete the cosmetic and symmetrical appearance of the Buccal cavity'.[26] Advocates of appendectomy advanced similar arguments to press the case for removing the appendix: 'There has been talk of a function for the Appendix', English surgeon Joseph Adams wrote in 1925, 'but as far as I am aware no one really knows what it is, and, surgically speaking, it is not an organ – it is a nuisance'.[27]

During the 1920s comparisons between chronic mastitis and appendicitis served to justify the surgical removal of inflamed or cystic breasts. British surgeon Sir Lenthal Cheatle used the term 'proemial' (i.e., antecedent or anticipatory) to describe a cystic condition of the breast which he considered to be a prelude to breast cancer. He recommended the removal of the 'proemial breast', arguing that it should be treated 'precisely in the same way and for the same reasons that compel surgeons to remove the appendix that has been inflamed. The proemial breast bears exactly the same relationship to cancer and papillomata of the breast as the proemial appendix does to general peritonitis.'[28]

Yet surgeons have frequently failed to appreciate that a 'functionless' organ may not necessarily be redundant from the patient's point of view. In the early 1950s, for example, the American surgeon George Pack expressed surprise that women resisted contralateral prophylactic mastectomy (a procedure to remove the unaffected breast in patients with malignancy in the other) more strongly than prophylactic oophorectomy. To Pack's mind, the 'sexual mutilation' by bilateral oophorectomy was more fundamental than that caused by double mastectomy. Pack could see 'no valid excuse' for the retention of the opposite breast if one became cancerous: 'the sacrifice of a useless organ such as the remaining breast does not make the patient a functional cripple, as would be the complete removal of other paired organs – such as the testes'.[29] In the post-war era some argued that the occurrence of post-mastectomy depression in older women should be regarded as an abnormal reaction, rooted in deeper neurotic conflicts around sexuality. Reflecting not only gendered assumptions about the social value of post-menopausal women, but also negative perceptions about the capacities of older workers in general, American physicians Richard Renneker and Max Cutler argued in 1952 that the emotionally mature woman did not show any excessive attachment to her breasts: 'We can say [her breasts] have served their purpose and she is now ready to accept their retirement.'[30]

Beliefs about the 'functionless' status of organs are vulnerable to criticism from within medicine itself. Howard Kelly, the American gynaecologist who authored the standard early twentieth-century text on appendicitis, warned in 1905 that arguments in favour of prophylactic appendectomy may well prove fallacious one day:

> the fact that the appendix has no known function does not prove that it is a functionless organ, although we are in the habit of calling it so; and it is within the bounds of possibility that an increase in our knowledge concerning it in the future may demonstrate some reason for its preservation. It is only a few years since the ovaries were considered to have no use or purpose besides that of reproduction, and their extirpation apart from interference with their primary function, was a matter of no importance. Now, when their relation to the process of internal secretion is beginning to be understood, we find ourselves responsible for their preservation for entirely other reasons.[31]

Kelly's observations remind us that the meanings attached to different organs can, and do, change over time: a surgical procedure regarded as abhorrent in one era may thus seem perfectly acceptable in another, and vice versa.

Circumcision: Surgical Vaccine or Mutilation?

These shifts in meanings and practices are strikingly illustrated by the therapeutic and prophylactic use of male circumcision. A predominantly Jewish and Islamic custom, circumcision was unthinkable in Christian countries before the middle of the nineteenth century.[32] According to the Western anatomical tradition, the prepuce was an essential part of the male sexual organ, analogous to the inner part of the vagina in women. Renaissance writers thought that its purposes were both erogenous and protective. Around 1840, though, a remarkable thing happened to the foreskin. In the writings of a number of anatomists, surgeons and physicians, it was transformed into a useless piece of skin and a threat to masculine health. The demonization of the foreskin was partly the result of anxieties about masturbation. Some practitioners believed that masturbation was essentially an attempt to relieve, by friction, the 'local irritations' caused by the accumulation of smegma under the foreskin; they thus recommended the excision of the foreskin to prevent boys and men from indulging in the 'solitary vice'. The suggestion that circumcision may prevent penile cancer was first made in discussions of phimosis, a condition where the male foreskin cannot be retracted from the head of the penis. In the late eighteenth century phimosis was regarded as a relatively uncommon disease of adult men, usually associated with syphilitic infection. By the mid-1850s, however, physicians were diagnosing phimosis in children under four years of age. 'Congenital phimosis' was thought to be favourable to the growth of cancer because it caused the retention of irritating secretions. Largely thanks to Jonathan Hutchinson, the chief advocate of circumcision in Victorian Britain, by the 1880s phimosis had been linked to a more definite 'pre-cancerous' stage of penile cancer. Hutchinson suggested that 'many hundreds of lives' would be saved every year if operations were performed at the 'pre-cancerous' stage. In 1890 he issued 'A plea for circumcision', in which he argued that the 'superior cleanliness of the Hebrew penis' demonstrated the necessity for circumcision.[33]

Recast as a hygienic measure, circumcision gained wide acceptance in Anglophone countries, particularly among the upper and middle classes.

In 1900 the *Medical Press* asserted that the practice should be made as compulsory as vaccination.[34] Historians of masculinity have noted the importance of circumcision in the context of late nineteenth-century redefinitions of manliness. At a time when sexual restraint and 'cleanness' were celebrated as core values for men, circumcision acquired new status as a physical marker of ideal manhood.

Objections to the practice were raised in the late 1800s by Elizabeth Blackwell, the pioneering feminist physician, and Herbert Snow, the cancer surgeon. Blackwell blamed the vogue for both circumcision and oophorectomy (the excision of normal ovaries) on surgeons' 'itch to cut'. She regarded circumcision as 'unnatural', expressing concerns that reputable but 'short-sighted' physicians were urging its performance in Christian nations for spurious reasons.[35] Herbert Snow published a pamphlet entitled *The Barbarity of Circumcision* to combat what he saw as an antiquated practice, involving considerable infliction of pain on helpless infants. Although he accepted the argument that phimosis could lead to penile cancer, he thought that the condition could be managed conservatively. Snow believed that the foreskin was not a redundant scrap of skin, but a structure 'obviously evolved by Nature for wise ends as a protective covering. Were there no necessity for its presence it would not occur.'[36]

Despite such criticisms, during the 1930s the practice of circumcision was advocated in Britain on the grounds that it may prevent not only penile, but also cervical cancer. William Sampson Handley, the influential cancer surgeon, asserted that women who had a circumcised partner were less likely to suffer from the disease: he surmised that 'marital infection with the sub-preputial flora' posed a threat to women.[37] The solution was to submit all male infants to 'preputiotomy', a simplified version of circumcision which, Handley claimed, could be performed after birth without an anaesthetic. He estimated that the incidence of cancer of the cervix might be reduced from about 4000 to 500 cases per annum if surgeons adopted preputiotomy as a routine procedure.[38] Even in Nazi Germany, as Proctor describes, circumcision received some support as a cancer prevention strategy: according to Arthur Hintze, a leading Berlin radiologists and professor of surgery, circumcision was the 'only definite example' of how 'cultural measures' could help conquer the disease.[39]

Circumcision was not a risk-free procedure, however. Its complications included injuries inflicted during the operation itself, infection, haemorrhage and ulceration.[40] Critiques of circumcision that emphasized the dangers of the practice became increasingly frequent during the mid-1930s. A few practitioners also began to question the medical rationale for routine circumcision. Liverpool practitioner R. Ainsworth, for example, criticized 'the cool assumption' of some surgeons that they knew better than providence how little boys should be made: 'It is quite time that this horrible mutilation should no longer be regarded as having any sanitary or therapeutic value, and phimosis should be relegated to the list of imaginary diseases', he argued.[41] A few physicians asserted that masturbation was a normal activity and that surgeons should not meddle with moral issues. They also questioned the 'just in case' mentality that drove surgeons to endorse prophylactic operations:

> To those who instance the occurrence of preputial lesions necessitating amputation in later life as a reason for preventive circumcision in infancy one would say – 'Why not eradicate the appendix, the tonsils? Why not expose the child to measles, mumps, whooping-cough, and chicken-pox?' Or is the doctor expected to be a prophet?[42]

The first statistical study of the risks and benefits of circumcision was published after the war. In 1949 Cambridge paediatrician Douglas Gairdner showed that approximately sixteen children died every year in Britain as a result of circumcision. Most of the deaths occurred for no apparent reason under anaesthesia, with haemorrhage and sepsis proving fatal in some cases.[43] Gairdner asserted that true phimosis was extremely rare, and he suggested that surgery should only be contemplated when more conservative methods had failed. He also noted that there wasn't enough evidence to warrant universal circumcision as a prophylactic against either venereal infection or cervical cancer. He did agree that the operation prevented penile cancer, but he argued that the same result could be achieved by keeping the prepuce clean.

During the 1950s, epidemiologists with an interest in the aetiology of chronic disease began to investigate the role circumcision might play in the prevention of cervical cancer. The first study, by Ernst Wynder *et al.*, appeared in the medical literature in 1954. Famous for his investigations of the health effects of smoking, Wynder was mostly concerned with lung and breast cancer, but he also carried out in-depth studies of many other malignancies. The 1954 study, which relied on a report by the female partner to assign circumcision status, concluded that Jewish women with circumcised partners were less likely to suffer from cervical cancer than non-Jewish women.[44] A second study by Wynder found, however, that only direct examination by a physician could determine circumcision status, thus casting into doubt the conclusions of the first study.[45]

American epidemiologists Jones, Macdonald and Breslow considered the relationship between circumcision and cervical cancer incidence in a study published in 1958; in contrast to Wynder, they could find no evidence of an association.[46] English epidemiologists Richard Doll and J. T. Boyd reached similar conclusions in a study published in 1964, although they did suggest that poor penile hygiene may be a risk factor for cervical cancer.[47]

Medical support for routine circumcision ebbed away in post-war Britain: by the mid-1970s, the circumcision rate in British hospitals had plummeted to about 6 per cent.[48] The operation was not included in the list of procedures covered under the NHS, so after 1948 parents who wanted to have their child circumcised were required to pay a surgical fee. In the British Dominions (Australia, New Zealand and Canada) the practice was in steady decline by the 1980s. In the United States, on the other hand, newborn circumcision for non-religious reasons continued to be a controversial, yet commonly performed surgical procedure.

The late twentieth century saw the emergence of an anti-circumcision movement that sought to link the practice with female genital mutilation, locating the issue within the larger legal and moral context of bioethics and human rights.[49] Advocates for circumcision were not silenced, however. Since the 1990s a number of studies have claimed that circumcision is a safe, one-time procedure that not only reduces the risk of developing both penile and cervical cancer, but also offers protection against sexually transmitted diseases (STDs) and urinary tract infections (UTIs): a ‘surgical vaccine’, comparable to the annual flu jab.[50] The history of circumcision suggests that the controversy is set to continue. Medical circumcision has been so common in Anglophone countries that most parents and physicians scarcely think of it as surgery. Yet many circumcised men feel diminished by the loss of the foreskin. In their view, circumcision is an unnecessary, deforming and psychologically traumatizing procedure.

The Controversial Ovary

In some respects, the use of surgery for the prevention of ovarian cancer resembles the circumcision controversy. Advocates for prophylactic oophorectomy have argued that women’s ovaries become superfluous after childbearing age. As they may become a target of cancer, they are best removed whenever the opportunity arises. The alternative view is that the ovaries secrete hormones that have both reproductive and non-reproductive actions. The potential life-saving benefits of bilateral oophorectomy are thus offset by long-term risks to health (lung cancer, coronary heart disease, Parkinsonism and osteoporosis), which increase the earlier the procedure is carried out. Oestrogen therapy may reduce some of the deleterious effects, but not all. Thus in women at average risk of ovarian cancer, it is better to leave things be than intervene.[51]

The removal of normal ovaries has a long and controversial history. Popularized by the American gynaecologist Robert Battey in the late 1800s, it was used for the treatment of a variety of conditions, from dysmenorrhoea to 'menstrual epilepsy'. Battey called it 'normal ovariotomy' to indicate that the removal of non-cystic ovaries was involved; in Britain the term 'oophorectomy' was generally used. Battey's operation was more popular in America than in Britain. The prevailing view in Britain was that the ovaries should be respected because they were 'the organs of sexual life, making a woman what she is, fitting for her duties of womanhood, including childbearing'.[52]

The vogue for oophorectomy was important in drawing medical attention to the consequences of a premature menopause.[53] Gynaecologists noted that oophorectomized women experienced post-operative symptoms of greater severity than after natural menopause. In an effort to replace the lost function, they administered ovarian extracts, and they also grafted healthy portions of the patient's own ovaries in locations different from their anatomical site. It soon became apparent that ovarian extracts were unreliable, however, and that even autografting was not always successful. Gynaecologists thus gradually came to the conclusion that the best policy was to avoid surgery in minor pathological conditions.[54]

In the early 1900s the reconceptualization of the ovaries as endocrine organs prompted gynaecologists to investigate their role in the regulation of women's metabolism. Laboratory evidence that bilateral oophorectomy had a marked physiological effect on the organism as a whole reinforced the case for a more cautious approach to the excision of ovaries. In 1912 Louise McIlroy declared that 'the ovary is not an organ with the single role of reproduction, but is an essential factor in the maintenance of the equilibrium which exists between the so-called ductless glands or endo-secretory organs'.[55] Removal of ovaries for slight pathological affections, or for the alleviation of menstrual derangements, was thus against the best interests of the patient.

During the interwar years the great majority of gynaecologists emphasized the importance of conserving the ovaries in younger women undergoing pelvic surgery. Attitudes towards ovarian ablation in peri- and post-menopausal women were more mixed, however. Some gynaecologists never removed a normal-looking ovary, no matter how old the patient was. The eminent gynaecologist Victor Bonney, for example, declared in 1937 that 'except in malignancy, the surgeon should strive to preserve in the patient's body every atom of undiseased ovarian tissue'.[56] Others recommended excision whenever a hysterectomy was undertaken for benign conditions, in order to prevent the occurrence of post-operative complications that might require further surgery – for example, the development of adhesions.[57]

In the late 1930s, gynaecologists found another reason why the ovaries of older women should not be left behind at hysterectomy: the danger that they might become malignant. Ovarian cancer was less common than uterine cancer, but it was far deadlier because it was usually discovered when it had already spread through the body. As it was much harder to detect, it was not thought to be an appropriate target for educational campaigns based on the promise of cure through early detection and treatment. Gynaecologists' pessimism about ovarian cancer stood in stark contrast to their optimism about breast or cervical cancer: 'Little benefit can be expected from attempts at public education', the American gynaecologist Harold Speert wrote in 1949. 'One of the outstanding features of ovarian cancer is its insidious course and the notorious absence of symptoms until the disease is well advanced … The onset of symptoms is usually indicative of an incurable stage of the malignant process.'[58]

It was the perceived 'insidiousness' of ovarian cancer, rather than its incidence, which prompted calls for the prophylactic removal of normal ovaries in older women. In 1942 Harry Sturgeon Crossen, the American gynaecologist and author of a highly regarded textbook of gynaecology, raised the alarm over the menace of 'silent' ovarian carcinoma. Crossen depicted the disease as 'a form of creeping death' that eluded early discovery.[59] Twelve case histories from his own practice dramatically illustrated the point. All the patients had consulted the physician when the tumour was already in an advanced stage. Despite undergoing extensive surgery or X-ray therapy, eleven of the twelve women had died within one year of diagnosis. Could anything be done to tackle the problem of delay in the diagnosis of ovarian cancer? Efforts to control cervical cancer suggested to Crossen that two strategies may be viable: increased surveillance of middle-aged patients through regular pelvic examinations, and prophylactic oophorectomy whenever abdominal surgery was done for any reason in women past their childbearing years. He regarded the excision of the 'involuting ovary' as being no different in principle from the practice of amputating the cervix in cases of chronic cervicitis or other chronic irritation of the cervix. The ovaries, he explained, had a 'halo' about them, but they were only 'temporary organs that cease to function after a certain period'. By the time a woman was in her early forties, they were 'no longer an important part of the economy but vestigial structures which carry a special tendency toward cancer – and toward a particularly dangerous form of cancer, in that it develops to an incurable stage without warning symptoms'.[60]

In the United States, anti-cancer campaigners encouraged women to have regular pelvic examinations for cancer detection, but most gynaecologists recognized that it was impossible to establish this level of surveillance in the entire population. The removal of 'vestigial' organs thus seemed to provide a sound practical alternative. In a study of the case histories of patients with ovarian cancer at Sloane Hospital in New York, Speert highlighted 'several instances in which conservatism seems to have been overdone, to the detriment of the patient'.[61] Speert asserted that 'in a postmenopausal woman undergoing hysterectomy, the desirability of bilateral oophorectomy is clear-cut and generally accepted', adding that an abdominal operation was an opportunity 'to remove useless or suspect organs'.[62] Much like the appendix, the involuting ovary was a redundant organ, best removed in case it might do harm.

During the 1960s prophylactic oophorectomy became a common procedure in older women undergoing hysterectomy for benign conditions, with one American commentator describing the post-menopausal ovary as a 'shriveled husk' which would pose a danger to women if not removed.[63] The shift in outlook in Britain can be gauged through successive editions of Bonney's classic *Textbook of Gynaecological Surgery*. The sixth edition, published in 1952, stated that the nearer a woman was to the climacteric, the less was the value of the ovaries in her economy. But as even women aged fifty or over could experience violent climacteric reactions, the best course of action was to conserve the ovaries.[64] The seventh edition of the textbook, revised and updated by London gynaecologists Douglas Macleod and John Howkins in 1964, still recommended conservation of healthy ovarian tissue in pre-menopausal women, but it now sanctioned bilateral oophorectomy in women aged forty-five and above. After this age, Macleod and Howkins argued, ‘the nuisance value of the ovary as a site for neoplasm in our opinion outweighs its value and usefulness’.[65]

This shift in attitude was largely due to the belief that a short course of endocrine therapy could tide oophorectomized women over if they experienced menopausal symptoms. Natural oestrogen had been isolated in the 1920s, but before the introduction of synthetic oestrogens, oestrogen therapy was extremely expensive: bought on the open market, a course of treatment might cost hundreds of pounds.[66] Then in 1938 two synthetic oestrogens were produced: ethinyl estradiol, by scientists at Schering in Germany, and diethylstilboestrol, by Edward Charles Dodds in London.[67] Stilboestrol had a number of advantages over natural hormonal preparations: it was cheaper, more powerful, and easier to administer. Women who might have baulked at the prospect of an abrupt menopause could now be reassured that they need not fear the consequences of oophorectomy. According to Speert, oral oestrogens could meet the need for endocrine therapy ‘so easily, so effectively, and so economically, as to remove in large measure the fear of the change of life long shared by patient and doctor alike’.[68]

Stilboestrol also produced disagreeable side-effects, however: in the late 1930s reported adverse reactions included nausea, diarrhoea, skin rashes and dizziness.[69] The other problem with both natural and synthetic oestrogens was that their long-term risks were unknown.[70] Most worrying of all was the possibility that prolonged use might cause cancer. As early as 1933 Dodds and his co-workers, just on the verge of producing synthetic oestrogens, had noted that the chemical structure of oestrogen was similar to that of carcinogenic hydrocarbons.[71] Around the same time Antoine Lacassagne, the French pathologist and radiotherapy pioneer, showed that oestrone injections, if repeated over a period of several months, could produce breast cancer in mice.[72] British workers responded by arguing first, that in other experiments oestrin had shown no sign of carcinogenic properties; second, that oestrone only produced an increase in the incidence of mammary and other carcinomas when it was injected in large quantities from birth in susceptible strains of mice; third, that the molecular structure of oestrone was closer to that of the male sex hormones than to that of the carcinogenic hydrocarbons.[73] This was only partly reassuring, however, as it did suggest that it might not be a good idea to prescribe oestrogens for women already diagnosed with cancer, or at high risk of developing the disease. A leading article in the *Lancet* for March 1940 observed that the evidence about the carcinogenic effects of long-term oestrogen therapy was still inconclusive, but it also stated that oestrogens should not be given to women already suffering from breast or cervical cancer.[74] In a review of the literature on cancer of the breast published in 1952, radiologist D. Smithers and colleagues urged colleagues to take a more cautious view: 'At the present moment', they stated, 'we may merely doubt the wisdom of the way in which oestrogens are so freely administered for long periods.'[75]

Professional caution was prompted not only by concerns about the welfare of patients, but also by the fear of litigation. Some physicians worried that women who developed breast or uterine cancer after a course of oestrogen therapy might sue their physicians for malpractice: thus in 1936 Dr Elizabeth Hunt, a London practitioner, advised colleagues to obtain the full informed consent of the patient before prescribing oestrin.[76] Medical fears of litigation were confirmed in 1948, when the *Journal of the American Medical Association* reported the first known medical malpractice suit concerning the prescription of stilboestrol in the United States. The plaintiff, who had developed breast cancer after a course of oestrogen therapy, claimed that her doctor knew she had a family history of breast cancer; he had thus acted negligently by prescribing the treatment.[77]

In the early 1950s increasing rates of bilateral oophorectomy prompted some gynaecologists to query the rationale for the practice. In 1952 James C. Doyle, assistant professor of gynaecology at the University of Southern California Medical School, conducted a survey of 546 operations with removal of 704 normal ovaries. The greatest number had been removed in patients aged 40–45, but 177 ovaries had been removed in patients aged between 30 and 39, and 56 in patients in the 20–29 age-bracket. In women aged between 20 and 45 bilateral oophorectomy had been done in 88 cases; in patients aged over 45 years, bilateral oophorectomy had been carried out in 70 out of 171 cases. Doyle criticized the 'unwarranted sacrifice' of normal ovaries: 'The advent of hormone therapy seems to have engendered an attitude of decreased concern with ovarian conservation', he stated. 'This tendency to remove organs that could continue to function normally, it is felt, is to be deplored.'[78] In 1957 Norman Jeffcoate, the well-known Liverpool gynaecologist, estimated that the risk of a woman developing primary ovarian carcinoma after hysterectomy was between one in 3000 to one in 5000: thus an active gynaecologist could be expected to prevent just *one* case of ovarian cancer during his professional lifetime, 'and then at the expense of perhaps 5,000 surgical menopauses'.[79]

During the 1950s evidence about the effects of bilateral oophorectomy on long-term health provided some ammunition against the practice. In 1953 the American physician David Barr suggested that natural oestrogens played a part in lipid metabolism.[80] Six years later Michael Oliver, a cardiologist at Edinburgh's Royal Infirmary, and G. Boyd, a biochemist in the University of Edinburgh Medical School, found that a premature menopause was followed by significant changes in cholesterol levels and an increased incidence of cardiovascular disease. They concluded that complete removal of the ovaries should be avoided in pre-menopausal women. In all cases where the operation was necessary, they recommended hormone replacement therapy (HRT) until the age of fifty.[81] In the 1950s, however, it was still unclear whether the metabolic effects of oophorectomy could be fully reversed by the administration of synthetic hormonal preparations.[82] According to Alex Culiner, a British-trained gynaecologist practising in Los Angeles, controlling menopausal symptoms was one thing; restoring a 'distorted endocrine balance' was another.[83]

Given the uncertainties, some gynaecologists hedged their bets by removing one ovary only: the thinking here was that the excision of one ovary reduced cancer risk by 50 per cent, while preserving some ovarian function. But this policy gave no guarantee that the 'right' ovary would be removed: as critics argued, clinical evaluation alone was not sufficient to establish whether an ovary was potentially malignant or not. In sum, there was a strong argument for conserving the ovaries in pre-menopausal women with no history of carcinoma.

Evidence that the ovaries continued to secrete hormones long after the climacteric had set in also began to emerge in the late 1950s.[84] In the United States, this research attracted the attention of Catholic theologians anxious to provide a moral perspective on medical problems. During the 1950s and 1960s, medical ethics was a thriving branch of Catholic moral theology in the United States. In fact, more work was done in medical ethics in America than in any country in the world, and much of this wok focused on questions of pregnancy and reproduction. In 1960 Thomas O'Donnell, a Jesuit priest teaching at Georgetown University Medical School, turned his attention to 'definitive pelvic surgery', a term used at the time to describe the removal of non-diseased uterus or ovaries in conjunction with surgery for other pathological conditions of the reproductive organs. O'Donnell asked whether bilateral oophorectomy undertaken after a necessary hysterectomy should be considered a 'mutilation' under the principle of totality. The origins of this principle are rooted in the writings of Thomas Aquinas, the thirteenth-century philosopher who sought to reconcile the teachings of Aristotle with the theology of the Catholic Church. According to Aquinas, all the organs and parts of the body exist for the sake of the whole person. Because the purpose of the part is to serve the whole, any action that damages a part of the body or prevents it from fulfilling its purpose violates the natural order and is morally wrong. Father O'Donnell argued that the mere statistical probability of future ovarian cancer could not justify the routine removal of post-menopausal ovaries, simply because their generative role had been exhausted. Medical evidence about the functional role of the ovary in the post-menopause suggested that the removal of healthy ovaries was 'morally contraindicated except in those cases where sound clinical judgment recognizes a positive indication of future serious complications'.[85] From this perspective, it could be argued that anyone who removed non-diseased ovaries after the menopause was guilty of acting in an unethical manner. A question that certainly deserves further examination concerns the role that Catholic theologians might have played from the 1960s onwards in creating a new conceptual framework for medical practices such as circumcision and prophylactic oophorectomy. The term 'bioethics' itself was coined in 1970 in the United States during the course of discussions about the proposed establishment of a centre for the application of ethics to medicine, based at Georgetown University, and funded by the Kennedy Foundation.

In the early twenty-first century, an alternative narrative for the menopausal ovary began to emerge, which stressed its continuing value to the ageing woman as an endocrine organ affecting the general economy. This served to refocus the debate on the harmful impact of bilateral oophorectomy on women's health, not only in women who underwent oophorectomy before the natural menopause, but also in those who were peri- and early post-menopausal.[86] A number of studies concluded that the risks of removing normal ovaries in women at average risk of ovarian and breast cancer by far outweighed the benefits. There remained a small group of women, deemed to be at high genetic risk, for whom the operation was unequivocally advocated, despite the fact that many of the criticisms of routine prophylactic oophorectomy apply to carriers of inherited mutations of the BRCA genes: for example, increased risk of breast cancer arising from prolonged use of HRT to compensate for the deleterious effects of premature menopause. Thus at a time when the legitimacy of prophylactic oophorectomy was in crisis, BRCA research provided a new patient population for the procedure. As sociologist Kelly Happe argues, 'similar to the discovery of ovarian cancer as a justification for oophorectomy in the late 1930s, interest in the treatment of BRCA carriers is a historical event in which a number of institutional interests have converged, creating a new constituency for the long-embattled procedure'.[87] Interestingly from the point of view of attitudes to the ovary, the only women for whom surveillance is regarded as a rational alternative to surgery are those who express a desire for children. It would thus seem that, despite recent attempts to reconceptualize the ovary, this controversial organ remains valued only because of its role in reproduction.

The Pre-Cancerous Uterus

Cultural assumptions about the value of the uterus as a reproductive organ have also informed surgical approaches to the management of the 'pre-cancerous' uterus. The tendency in gynaecology has been to favour a conservative approach to the treatment of supposedly pre-cancerous clinical conditions or lesions in younger women of childbearing age. For women who had either completed their families, or who were approaching the menopause, more radical interventions have been advocated: from cervical amputation, to hysterectomy.

The first phase of prophylactic surgery for uterine cancer began in the late 1860s, when Thomas Emmet, the well-known American gynaecologist, proposed that unrepaired cervical tears were a significant cause of gynaecological disease, including cervical cancer.[88] Emmet claimed that gynaecologists often amputated a torn cervix in the erroneous belief that it was 'elongated' or 'hypertrophied'. The practice, he argued, was both unnecessary and harmful: amputation 'maimed' women, frequently rendering them sterile. After a number of attempts, he developed a method for suturing the cervix, which was subsequently named for him (in England the term trachelorraphy, from the Greek words *trachelos*, neck, and *rhaphe*, suture, was also used).[89]

Emmet's operation was introduced into Britain by Robert Barnes, the eminent Victorian gynaecologist. It was subsequently championed by William Playfair and Graily Hewitt, both well-known obstetricians in London.[90] A few English gynaecologists dismissed the view that cervical tears required suturing, arguing that evidence of a direct link between childbirth injury and cancer was lacking.[91] By the early twentieth century, though, the consensus was that a damaged cervix was more liable to infection. As chronic infection was thought to induce proliferative changes in the tissues, British gynaecologists began to pay more attention to the prevention of tears during childbirth, and to their prompt treatment afterwards.

Married women who had had more than one pregnancy frequently developed chronic inflammatory conditions such as endocervicitis. The first line of attack in such cases was medicinal treatment. If this failed, a range of options were available: cauterization, electrocoagulation, amputation and hysterectomy. What type of treatment a woman might get depended not only on the severity of the condition, but also on her age and childbearing status. A woman who had completed her family and/or was approaching the climacteric was far more likely to have her cervix amputated, or uterus removed, than a younger woman in her childbearing years.[92] Conserving the cervix in younger women was deemed to be important because amputation was associated with a high incidence of sterility and impaired sexual functioning.[93] Bearing in mind early twentieth-century concerns about plummeting birth rates and 'race suicide', it is perhaps not surprising that gynaecologists should have been anxious to preserve reproductive capacity: as the Irish obstetrician Edward Solomon commented in 1941, 'sterility has sufficient causes without adding to them by radical operations of the cervix … Emmet was right when he said that trachelorraphy increased the fertility'.[94] Canadian gynaecologist Murray Blair emphasized that amputation in cases of endocervicitis was a menace to further pregnancies. He recommended a conservative approach in younger women because, without the protection of the cervix, 'the uterus and the ovaries lose all their romance and much of their use. Their major function, creation, is lost.'[95] Bristol gynaecologist R. S. Statham, writing in 1929, stressed that treatment must be tailored to the patient: 'It is impossible to apply the same rules of treatment to the patient with an extensive laceration as to the one with no tear at all', he asserted. 'It is equally useless to group together the young woman with an infection following her first childbirth and the patient of 55 who will not become pregnant again.'[96] The rationale for treating older women differently was clearly spelled out in 1911 by F. P. Sturm, a surgeon practising in northern England. Sturm had been consulted by a patient aged 39, the mother of a large family. The woman had been suffering for years from endometritis, a condition believed to predispose to cancer. As the disease had proved resistant to treatment by curettage, Sturm advised hysterectomy. This drastic measure was not a common treatment for chronic endometritis, but Sturm thought it justifiable in this particular case: 'The minor procedure of curetting … is at best a palliative measure, more likely to determine the onset of malignant degeneration than to eradicate pre-cancerous conditions', he said.

> There is no reason why any woman, within sight of the menopause, who is suffering from such a distressing complaint, should retain an organ which is not only useless but is even a constant menace to her health and existence, especially when that organ has already satisfactorily performed all the functions for which it was created.[97]

In the interwar period, gynaecologists began to pay increasing attention to pre-clinical, 'latent' carcinoma of the cervix. With the diffusion of the Pap smear after the war, abnormal findings ranging from *in situ* cervical cancer (CIS) to minor borderline lesions (dysplasias) became more common.[98] How should a gynaecologist manage these cases? The answer to this question depended in part on how one viewed proliferative changes that were not yet invasive. Some thought that intra-epithelial lesions (CIS) inexorably progressed to malignancy; others believed that the majority of untreated lesions regressed or remained unchanged for many years. There was also a lot of debate about the differentiation of CIS from lesser grades of abnormality: most gynaecologists believed that minor proliferative changes were clinically benign, but some experts claimed that they were 'pre-invasive'.

The problematic status of CIS generated various approaches to its management: from simple cold-knife conization of the cervix (i.e., the excision of a cone-shaped sample of tissue), through to cervical amputation, total hysterectomy and the modified Wertheim procedure advocated by Harvard gynaecologist Richard TeLinde.[99] During the 1950s most British and American authorities recommended a total hysterectomy (i.e., the removal of the whole uterus and cervix). There were two main arguments in favour of the procedure. The first was that the risk of progression of the lesion to invasive carcinoma justified the risks associated with the surgery. The second was that surgery eliminated the need for lifetime surveillance. Proponents of hysterectomy recommended 'definitive' treatment for those who could not be relied upon to comply with long-term follow-up. They also advised surgery for the patient whose family was complete, arguing that the constant follow-up required with conservative methods was not justified in such cases: a uterus that had become 'redundant' was, by definition, dispensable, particularly if there was any hint that it might become liable to cancer.[100] In defence of this policy, some gynaecologists argued that women accepted the decision cheerfully because of its 'fringe benefits' – sterilization, and release from the nuisance of menstruation and its disorders.[101] Others noted, however, that hysterectomy could have adverse psychological consequences for the patient and/or her husband. Some women felt 'desexed' after surgery. A few husbands complained that their wives were no longer feminine, and they refused to have further sexual relations with them.[102]

Exceptions to the general rule were made when it was desirable to preserve reproductive potential. Most clinicians regarded a woman's desire for children as an important factor in clinical decision-making. Howard Taylor, the eminent American gynaecologist, observed in 1952 that to many gynaecologists, 'the removal of the entire uterus from a young woman for a minute lesion probably limited to the lowest portion of the cervix and perhaps of uncertain biological potentiality seems still to be out of proportion'.[103] Young women diagnosed with CIS or lesser dysplasias were thus offered 'conservative' treatment if they wished for children. During the 1950s this usually meant cauterization or conization. The latter was 'conservative' treatment in the sense that it aimed to preserve the uterus and, with it, fertility, but 'conservative' treatment was not 'risk-free' treatment. Conization was an invasive procedure, carried out in hospital under anaesthesia. Possible complications included post-operative haemorrhage, sometimes requiring further intervention; pelvic infection, and cervical stenosis. The latter is associated with increased risk of spontaneous abortion, premature labour and sterility.[104]

Over time, the experience of treating CIS taught gynaecologists some important lessons. In 1966, for example, a review of the management of CIS at London's Chelsea Hospital for Women showed that none of the women treated conservatively during the 1950s and early 1960s had a recurrence or positive smear on follow-up.[105] On the other hand, a number of studies of recurrence after total hysterectomy revealed a variable but definite incidence of recurrences in the vagina. Half of these were CIS, but half were invasive carcinomas that might have been detected by regular follow-up.[106] Clearly, hysterectomy was not always the 'definitive' treatment for CIS, nor did it obviate the need for regular surveillance.

A few gynaecologists were prompted to question the rationale for hysterectomy in women who were at the end of their reproductive careers: 'If conservative management is practised in the young woman, why not in the older woman?', an Australian gynaecologist asked in 1966.

> It seems illogical to perform a total hysterectomy on a patient whose lesion is no more than a few square millimetres in area, even though she may be past the menopause, whereas a younger woman with deep gland involvement and an extensive lesion may need a hysterectomy. Both cases produce a positive smear.[107]

At the Cleveland Clinic in Ohio, gynaecologist James Krieger and pathologist Lawrence McCormack pioneered a more conservative approach in all cases, regardless of age and reproductive potential. Krieger and McCormack proposed that treatment should be determined by the extent of the disease and its response to treatment rather than by the age of the patient and her attitude towards future pregnancy.[108] They observed that the concept of CIS as a precursor of invasive cervical cancer had given this lesion 'a formidable character', but there was never a sudden transformation of CIS to invasive carcinoma. On the other hand, CIS and invasive cancer could coexist, so careful histological evaluation was essential. The Cleveland practitioners argued that it was both practical and safe to individualize treatment to the extent necessary for control of the lesion: 'In the management of carcinoma in situ involving the uterine cervix there is no place for dogma', they asserted in 1965. 'Consequently, careful histological and clinical evaluation must be carried out in each case … Careful, long-term follow-up studies are necessary after the completion of any treatment.'[109] Krieger and McCormack proposed a graded treatment plan. Exfoliative cytology was used both for detection, and for assessing the effectiveness of any treatment. If CIS was detected, conization was performed, and serial post-conization studies were done afterwards. If other pelvic pathological conditions were present, a vaginal or abdominal hysterectomy was performed. Hysterectomy was undertaken also in patients with persistently positive cytological findings in the first year after conization. After hysterectomy, long-term progress follow-up examinations were instituted. If extra-cervical CIS was found, it was treated by local excision, cautery, vaginectomy, or vulvectomy, depending on its location, extent and clinical behaviour.[110]

Krieger's and McCormack's pioneering work merits closer historical examination. It is to be hoped that future studies may provide a better understanding of their role in promoting a more conservative approach to the treatment of CIS. It would also be interesting to know more about the Cleveland Clinic and the part it played more generally in challenging mainstream radical approaches to cancer.[111] Krieger was recruited to the clinic in the early 1950s by George 'Barney' Crile, son of the famous surgeon and founding partner of the Cleveland Clinic, George Washington Crile. Crile Jr. had gained a controversial reputation in America by insisting that radical surgery for breast cancer and other malignancies served the interests of the surgeon rather than those of the patient. In 1950 he discontinued radical neck dissection on patients with papillary cancer of the thyroid, and in 1955 he also completely stopped performing the classic Halsted operation.[112] Crile Jr. claimed that 'fee-for-service' medicine provided an incentive to overtreat, as surgeons could get more money for larger and more mutilating operations.[113] At the Cleveland Clinic all physicians, surgeons and researchers were employed on a salaried basis. It has been argued that the unusual salaried structure, and an institutional culture that emphasized collaborations across specialties, fostered a more conservative orientation, encouraging clinic staff to do only what was strictly necessary for the individual patient.[114]

Historians have noted how, in Anglophone countries, a more conservative approach to the treatment of CIS began to emerge in the late 1970s.[115] By that time, a number of specialists were raising concerns not only about excessive numbers of hysterectomies, but also about the number of 'unnecessary' conizations done on rather mild positive smear results. A question that springs to mind is whether concerns about rates of intervention in younger women may have paved the way for a less aggressive treatment of CIS. Furthermore, bearing in mind that the highest rates of intervention were at centres where the Pap smear alone was used for screening, it is legitimate to ask whether anxieties about high rates of surgery in the younger age groups may have underlain the increasing interest in colposcopy, noticeable from the 1970s onwards. The use of the colposcope as a secondary screen gave gynaecologists greater confidence in managing CIS, legitimating the use of 'conservative' methods such as cryosurgery, electrocautery, electrodiathermy or multiple punch biopsies.

Notions of risk and corresponding uncertainty are at the very core of medical practice. Physicians often have to settle for a probable diagnosis. What's more, each treatment option comes with its own probability of success, side-effects and fatality. Uncertainties are framed in terms of calculable risk, to provide an objectified and neutral assessment. Inevitably though, processes of risk assessment and management involve value judgements. History can reveal the socially and culturally contingent nature of risk assessment. An analysis along these lines is useful not only from an academic point of view, but also as a means of determining appropriate strategies in clinical decision-making.

NOTES

1. Robson, 'The Bradshaw Lecture on the Treatment of Cancer', p. 1501.
2. Ibid., p. 26.
3. Rodman, 'Cancer and Precancerous Conditions', p. 63. See also Childe, *The Control of a Scourge*, pp. 223–4.
4. Maclaren, 'Address in Surgery', p. 259.
5. Ibid., p. 262.
6. Rhoads, 'Development of Preventive Surgery'.
7. Maclaren, 'Address in Surgery', p. 263. See also Pye-Smith, 'Prophylaxis in Surgery'.
8. The focal infection theory was popularized by the American physician Frank Billings; Gibbons, 'Germs, Dr Billings, and the Theory of Focal Infection'. Billings claimed that circumscribed foci of bacteria, localized to various parts of the body, could cause myriad systemic diseases – from rheumatism to endocarditis.
9. See e.g. Barnes, 'Prophylactic Tonsillectomy'.
10. Glover, 'The Incidence of Tonsillectomy among Children'. Glover's pioneering study is an early example of the use of epidemiology for understanding rates of intervention.
11. Carne, 'Incidence of Tonsillectomy, Circumcision, and Appendicectomy among RAF Recruits'.
12. Chapin, *How to Avoid Infection*, p. 11.
13. Ibid., p. 10.
14. Barr, 'What Are We? What are We Doing Here?', p. 162.
15. Leary, 'Surgical Method of Clearing up Chronic Typhoid Carriers'; Nichols *et al.*, 'The Surgical Treatment of Typhoid Carriers'; Henes, 'Surgical Treatment of Typhoid Carriers'. Leavitt mentions the practice in a study of the impact of bacteriology on public health; Leavitt, '"Typhoid Mary" Strikes Back', pp. 34–5. Mary Mallon, the first asymptomatic typhoid carrier identified in New York City, was urged to have the operation, but she refused.
16. For a discussion from the ethicist's point of view, see Benatar (ed.), *Cutting to the Core*.
17. Maclaren, 'Address in Surgery', p. 259.

18. Rhoads, 'Development of Preventive Surgery', p. 783.
19. Ibid.
20. Quoted in Tobey, *Cancer: What Everyone Should Know about It*, p. 65. See also Patterson, *The Dread Disease*, p. 91.
21. Lefebvre, 'What Is the Role of Primary Surgery in the Treatment of Laryngeal and Hypopharyngeal Cancer?', p. 285.
22. See e.g. Morrison, 'The Production of Voice and Speech Following Total Laryngectomy'.
23. Jackson, 'Cancer of the Larynx', p. 12. Bloodgood was later to adopt a more conservative approach to the treatment of chronic mastitis; Bloodgood, 'Chronic Cystic Mastitis'.
24. Cutler, 'Radiotherapy of Early Cancer of the Larynx'.
25. Wassersug and Lieberman, 'Why the Modern Eunuch Remains Invisible'. See also Cushman, Phillips and Wassersug, 'The Language of Emasculation'.
26. Barnes, 'Prophylactic Tonsillectomy', p. 3.
27. Adams, 'An Address on the Mortality of Appendicitis', p. 723.
28. Cheatle, 'Cancer of the Breast: Treatment of the Proemial Breast', p. 870.
29. Pack, 'Argument for Bilateral Mastectomy (Editorial)', p. 931.
30. Renneker and Cutler, 'Psychological Problems of Adjustment to Cancer of the Breast'.
31. Kelly, *Appendicitis and Other Diseases of the Vermiform Appendix*, p. 419.
32. On the history of circumcision, see Darby, *A Surgical Temptation*; Gollaher, *Circumcision*; Moscucci, 'Clitoridectomy, Circumcision, and the Politics of Sexual Pleasure'.
33. Hutchinson, 'A Plea for Circumcision'.
34. 'Editorial (Circumcision)'.
35. Blackwell, *The Human Element in Sex*, pp. 35–6.
36. Snow, *The Barbarity of Circumcision*, pp. 42–3.
37. Handley, 'The Prevention of Cancer'.
38. Handley, 'Penile Carcinoma'.
39. Proctor, *The Nazi War on Cancer*, pp. 66–7.
40. Snow, *The Barbarity of Circumcision*, pp. 35–42.
41. Ainsworth, 'Circumcision'.
42. Faull, 'Circumcision'. See also MacCarthy, 'Fate of the Foreskin'.
43. Gairdner, 'The Fate of the Foreskin'.

44. Wynder, Cornfield, Schroff and Doraiswami, ‘A Study of Environmental Factors in Carcinoma of the Cervix’.
45. Wynder and Licklider, ‘The Question of Circumcision’.
46. Jones, MacDonald and Breslow, ‘A Study of Epidemiologic Factors in Carcinoma of the Uterine Cervix’.
47. Boyd and Doll, ‘A Study of the Aetiology of Carcinoma of the Cervix Uteri’.
48. ‘The Case against Neonatal Circumcision’.
49. Gollaher, *Circumcision*, pp. 161–85.
50. Simonsen *et al.*, ‘Human Immunodeficiency Virus among Men with Sexually Transmitted Diseases: Experience from a Center in Africa’. See also Marx, ‘Circumcision May Protect against the AIDS Virus’.
51. For an overview, see Rocca and Ulrich, ‘Oophorectomy for Whom and at What Age?’
52. ‘Normal Ovariotomy: Batteys’ Operation: Tait’s Operation’, p. 577. On the ‘unsexing’ of women, see Moscucci, *The Science of Woman*, pp. 134–64.
53. Sengoopta, *The Most Secret Quintessence of Life*, Chapter 2.
54. McIlroy, ‘The Physiological Influence of Ovarian Secretion’; Biedl, *The Internal Secretory Organs*; Bell, ‘The Relations of the Internal Secretions to the Female Characteristics and Functions’.
55. McIlroy, ‘The Physiological Influence of Ovarian Secretion’, pp. 610–11.
56. Bonney, ‘The Fruits of Conservatism’, p. 6.
57. Young, *A Text-Book of Gynaecology*, 4th ed.
58. Speert, ‘Prophylaxis of Ovarian Cancer’, p. 468.
59. Crossen, ‘The Menace of “Silent” Ovarian Carcinoma’, p. 1487.
60. Ibid., p. 1487. On ovarian cancer’s image, see Jasen, ‘From the “Silent Killer” to the “Whispering Disease”’.
61. Speert, ‘Prophylaxis of Ovarian Cancer’, p. 470.
62. Ibid., p. 469.
63. ‘Goodbye to the Menopausal Ovary’, p. 667.
64. Bonney, *A Textbook of Gynaecological Surgery*, p. 240.
65. Macleod and Howkins, *Bonney’s Gynaecological Surgery*, p. 471.
66. Pfeffer, *The Stork and the Syringe*, pp. 75–6.
67. Bishop, Boycott and Zuckermann, ‘The Estrogenic Properties of “Stilboestrol”’.
68. Speert, ‘Prophylaxis of Ovarian Cancer’, p. 473.

69. Bishop, Boycott and Zuckermann, 'The Estrogenic Properties of "Stilboestrol"'; Shorr, Robinson and Papanicolaou, 'A Clinical Study of the Synthetic Estrogen Stylbestrol'; 'Clinical Use of Stilboestrol'.
70. 'Risks of Oestrogens'.
71. Cook, Dodds and Hewett, 'A Synthetic Oestrus-Exciting Compound'.
72. See e.g. Lacassagne, 'Hormonal Pathogenesis'; Lacassagne, 'The Relation between Hormones and Cancer'.
73. Bishop and Dodds, 'Oestrin and Cancer'; Parkes, Bishop and Dodds, 'Oestrin and Cancer'; Cramer and Gye, 'Oestrin and Cancer'.
74. 'Risks of Oestrogens'.
75. Smithers, Rigby-Jones and Galton, 'Cancer of the Breast: A Review'.
76. Hunt, 'Oestrin and Cancer'.
77. 'Medicolegal Abstracts. Malpractice: Cancer Ascribed to Stilboestrol – Statute of Limitations'.
78. Doyle, 'Unnecessary Ovariectomies', p. 1109.
79. Jeffcoate, *Principles of Gynaecology*, p. 667. See also Schabort, 'Oophorectomy'.
80. Barr, 'The George E. Brown Memorial Lecture: Some Chemical Factors in the Pathogenesis of Atherosclerosis'.
81. Oliver and Boyd, 'Effects of Bilateral Ovariectomy'.
82. 'Hysterectomy: with or without Oophorectomy?'
83. Culiner, 'The Controversial Ovary', p. 30.
84. Randall, Birtch and Harkins, 'Ovarian Function after the Menopause'; Masukawa, 'Vaginal Smears in Women Past Forty Years of Age'.
85. O'Donnell, 'Definitive Pelvic Surgery', p. 660.
86. Rocca and Ulrich, 'Oophorectomy for Whom and at What Age?', p. 1. See also Clarke, Chang and McPherson, 'Removing Organs "Just in Case"'; Bajaj and Klugman, 'Risk-Reducing Salpingo-Oophorectomy'; Santoro, 'Just in Case Versus Just in Time'.
87. Happe, *The Material Gene*, pp. 86–7.
88. Emmet, *The Principles and Practice of Gynecology*, pp. 481–4.
89. The procedure became so popular in America that by the late 1800s Chicago gynaecologist E. C. Dudley was raising concerns about its 'abuse'; Dudley, 'The Abuse of Emmet's Operation'.

90. Hewitt, 'Clinical Lecture on the Laceration of the Os and Cervix Uteri'.
91. Phillips, 'Plastic Gynaecological Operations', p. 766.
92. See e.g. H. Williamson's comments on McCann, 'The Pre-Cancerous Uterus', p. 11.
93. Solomons, 'A Survey of the Results of Repair and Amputation of the Cervix'.
94. Ibid., p. 471.
95. Blair, 'A Conservative Treatment for Chronic Endocervicitis', p. 1483.
96. Statham, 'Treatment of Chronic Endocervicitis', p. 661.
97. Sturm, 'Vaginal Hysterectomy for Endo-Metritis', p. 1170.
98. In California, for example, the proportion of *in situ* cervical cancer (CIS) to all cervical cancer cases went from zero in 1942, to 56 per cent in 1963. Linden and Dunn, Jr., 'Earlier Diagnosis of Cervical Cancer'.
99. TeLinde and Galvin, 'The Minimal Histological Changes in Biopsies'. On the use of conization as treatment, see Weekes, 'Preinvasive Carcinoma of the Cervix'.
100. Sir Norman Jeffcoate, professor of obstetrics and gynaecology at the University of Liverpool, expressed reservations about the use of hysterectomy for CIS. He thought, however, that hysterectomy may be justified with women likely to default from life-long follow-up; Jeffcoate, *Principles of Gynaecology*, 4th ed. p. 400. In 2011, the probability of default was still regarded as one of the main indications for hysterectomy in relation to treatment of CIS: see Yarbro, Wujcik and Gobel, *Cancer Nursing*, p. 1193.
101. 'Cervical Carcinoma in Situ (Editorial)', p. 1010.
102. Dallas, 'Hysterectomy – Total or Subtotal for Benign Lesions', p. 94.
103. Taylor, 'Controversial Points in the Treatment of Carcinoma of the Cervix', p. 437.
104. See e.g. Byrne, 'Cone Biopsy: a Survey of 100 Cases; Jeffcoate, *Principles of Gynaecology*, 4th ed. p. 492.
105. Lewis, 'Management of Carcinoma-in-Situ of the Cervix'.
106. See e.g. Mussey and Soule, 'Carcinoma in Situ of the Cervix'; Parker *et al.*, 'Intraepithelial (Stage 0) Cancer of the Cervix'; Beecham and Carlin, 'The Management of Cervical Carcinoma in Situ'.

107. Skipper, ‘The Conservative Management of Carcinoma in Situ’, p. 53.
108. Krieger and McCormack, ‘Cervical Carcinoma in Situ’; Krieger and McCormack, ‘The Individualization of Therapy’.
109. Krieger and McCormack, ‘Conservative Management by Conization’.
110. Ibid.
111. For a history, see Clough, *To Act as a Unit*.
112. Crile, Jr., *The Way It Was*, pp. 317–18. On Crile Jr., see Lerner, *The Breast Cancer Wars*, pp. 104–5, 129–30, 135–6. One of Crile’s most famous patients was Rachel Carson, the marine biologist and conservationist; see Aronowitz, *Unnatural History*, pp. 186–209.
113. Crile, Jr., *The Way It Was*, p. 295.
114. In the early twenty-first century, American healthcare reformers hailed the Cleveland Clinic, and the few other health systems that pay salaries to their doctors, as a model for the American health system as a whole. According to health reformers, doctors on a fixed salary are not incentivized to do more than is necessary for the patient; they are also more likely to collaborate with colleagues in other specialties, emphasizing choices that might help prevent major procedures and surgeries. See e.g. Harris, ‘Hospital savings: salaries for doctors, not fees’, *New York Times*, 24th July 2009.
115. Bryder, *Women’s Bodies and Medical Science*.

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CHAPTER 8

Conclusion

In 1927 Francis Carter Wood, an American cancer expert, explained that more women than men died of cancer ‘for the simple reason that there are two organs in women in which cancer frequently occurs that raise the percentage … the breast and the womb’. Because of ‘these two additional sites’, he concluded, ‘it is far more important for women to understand the cancer situation, and to act upon it, than for men’.[1] This gendered perception of cancer risk built on putatively biological distinctions of ‘sex’ elaborated in the nineteenth century: it was based on the assumption that man was the norm and woman a deviation from that norm. Nevertheless, the view that women are more likely to get cancer than men because they have ‘extra bits’ which are particularly susceptible to malignant disease does not fully explain why, around 1900, women’s cancers burst into the public domain. In this volume I have highlighted the importance of debates about the management of uterine cancer. This was not the disease known throughout the nineteenth century as a hopeless and invariably fatal condition, however. By 1900 uterine cancer had been rebranded as a relatively hopeful disease, curable by early surgery. The belief that early uterine malignancies could be eradicated by excision was not new, but it received a boost in the second half of the nineteenth century from new understandings of cancer, based on the idea that it was a ‘local’ disease of deviant cells.

The account provided in this volume suggests that uterine cancer had proved resistant to curative treatment—surgical or medicinal.

O. Moscucci, *Gender and Cancer in England, 1860–1948*,
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The results of the new ‘radical’ operations developed from the 1870s onwards did nothing to challenge the prevailing view that cancer could not be eradicated: patients usually died from recurrences of the disease. Furthermore, the new cancer surgery was extremely dangerous. Indeed, critics argued that it was far more likely to kill than cure. Surgery did seem to prolong life in those who survived the operation, particularly in cases of cancer of the body of the uterus. It was also an effective palliative – a most important point in cases of uterine cancer, bearing in mind the pitiful condition of sufferers. But did radical surgery produce *permanent* cures? By 1900, even the most brilliant gynaecologists recognized that, in most cases, all that surgery could offer was a period of disease-free survival. Historian Jason Szabo writes that ‘physicians had to be linguistically nimble whenever they discussed incurability, acknowledging medicine’s limits without undermining its authority’.[2] The introduction of the notion of ‘surgical cure’ and the emergence of the concept of ‘delay’ in treatment worked to produce the impression that medicine had not lost the war on cancer.

In both England and in the United States, it was the development of Wertheim’s extended abdominal hysterectomy which stimulated the first campaigns against uterine cancer. Particularly in England, Wertheim’s operation was fiercely contested by the great majority of obstetricians. English obstetricians, who had long fretted about the inroads made by abdominal surgeons in the field of women’s diseases, seized on the mortality statistics to discredit the new operation. The dispute over Wertheim’s hysterectomy was ultimately rooted in intra-occupational conflicts about the route to specialization in gynaecology. The question in Britain and elsewhere in Europe and America was whether gynaecology should be combined with general surgery or with obstetrics. Surgeons claimed that it should be divorced from obstetrics and placed under the control of general surgery, on the grounds that mastery of complex abdominal techniques required a broader surgical training. The pressure to bring together obstetrics and gynaecology came from the obstetricians, who faced losing a set of lucrative clinical activities. I have suggested that British critiques of Wertheim served to legitimate obstetricians’ turf claims, distinguishing the ‘conservative’ obstetrician from the ‘mechanical’ surgeon. Obstetricians claimed that expertise in the whole of femininity and reproduction generated an orientation towards conservation and function. This orientation could only be attained by combining gynaecology with obstetrics.

When radium and X-rays became available, gynaecologists and obstetricians were among the first to adopt the new technologies, initially as a means of dealing with cases deemed to be inoperable. British gynaecologists proved to be more interested in using radium than X-rays, largely because they did not control X-ray therapy. In contrast to Germany, gynaecological clinics in Britain were not equipped with their own X-ray facilities. X-ray therapy was mostly carried out by radiologists working in medical electricity departments, and gynaecologists were unwilling to refer women on for treatment. Cervical cancer proved highly radiosensitive. By the mid-1920s there was much evidence that the results of both radium and X-ray therapy of cervical cancer could be as 'good' as those of surgery. What gave radiation therapy an edge over surgery was the associated low mortality and the fact that the treatment did not cause women to lose their uterus. Advocates for radiotherapy used these arguments to reframe the provision of radiotherapy as a public health issue, claiming that the campaign for the early detection of uterine malignancies was more likely to succeed if women knew they would not have to undergo mutilating surgery.

During the 1920s attempts were made to develop the radium treatment of cervical cancer into an alternative to hysterectomy. The most successful centre in the UK was the Marie Curie Hospital in London, where women doctors achieved results that were the envy of most centres in the country. I have argued that radium therapy was a feminist cause in the 1920s. Marie Curie, the co-discoverer of radium, was revered by women the world over as a scientific icon and a shining example of women's capacities. British feminists supported the foundation of the Marie Curie Hospital in London. In the United States women's organizations and groups played a key role in raising money to purchase radium for Marie Curie. Feminist doctors found radiotherapy attractive not only because it confirmed their role as providers of healthcare to women, but also because it offered new employment opportunities at a time when they still faced many difficulties in establishing a career in medicine. The introduction of radiotherapy was thus also tied up with feminist efforts to reform medicine, both as a practice and as a profession.

The first campaign against cervical cancer was launched in England by the British Medical Association. During the early 1910s public health practitioners joined the fight against cervical and other 'accessible' cancers as educators. Building on expertise gained in the campaigns against TB and VD, a few Medical Officers of Health took steps to persuade laypeople to abandon the habits that might cause chronic irritation, and to consult the doctor early if they noticed suspicious symptoms in various body sites. After 1923, encouraged by the Ministry of Health, they began to play an increasingly important role in the organization and coordination of services at the local level. Breast, uterine, skin and lip cancer continued to provide a major focus of public health interest, first because they were deemed to be more 'accessible' for diagnosis and treatment, second because their detection could be added to the preventive activities already carried out at the municipal clinics established for maternity, TB and VD.

The expansion of public health activity into the field of cancer reflected broader changes in the ideology and practice of public health. Historians have traced the gradual accumulation of local government and public health duties from the mid-nineteenth century. By the early twentieth century, public health increasingly meant the delivery of personal health services, supported by a capacious concept of prevention. Some scholars have seen this as a negative development, arguing that the shift in focus from environmental to personal prevention weakened the social and political impact of public health activity.[3] The focus on the personal and the medical, it has been claimed, also meant that there was little to distinguish public health medicine from general practice. Negative evaluations of interwar public health underlie Domenech's and Castañeda's analysis of the part played by MOHs in the organization of radiotherapy services.[4] Their argument is that the introduction of radiation technologies led to the marginalization of the MOH's traditional concern with the environment, and a shift towards a managerialist and more reductive approach to cancer. The account offered in this volume does not corroborate this view. It is quite clear from contemporary discussions at Ministry of Health level that treatment was seen as an *addition* to the MOH's long-standing interest in social and environmental causes of disease. The Ministry of Health's 1931 report on cancer of the lip and oral cavity, for example, emphasized the importance of addressing environmental and lifestyle causes, including the effects of sun rays and radiation in general; of noxious substances such as tar and arsenic, and of poor oral hygiene. MOHs carried out statistical investigations into the causes of cancer, and they sought to advance lay education about cancer through initiatives such as health exhibitions and 'health weeks'.

The curative and preventive sides of medicine have come together through the use of surgery as prevention. I have stressed the need to look beyond prophylactic cancer surgery on women, to link preventive surgery for cancer with other preventive surgeries such as tonsillectomy, and to pay closer attention to the use of male circumcision as a strategy for the prevention of both penile and cervical cancer. I have argued that attitudes towards the prophylactic ablation of organs have been shaped by cultural values that have changed over time and across countries. My analysis highlights the impact of ageism in the management of cancer risk in women. Surgeons and gynaecologists have all too readily assumed that a woman's breasts, uterus and ovaries are dispensable once she has reached the end of her reproductive career. The case for intervention has been made on the grounds that it is better to prevent than to cure, but intervention has been thinkable only because of assumptions about the (in-)utility of allegedly 'redundant' organs.

Since 2005 studies of the risks and benefits of elective oophorectomy during hysterectomy have questioned the rationale for removing ovaries 'just in case', highlighting the adverse health benefits to women who are peri-menopausal or post-menopausal. The consensus now is that 'risk-reducing' salpingo-oophorectomy should be reserved for BRCA1/2 mutations carriers. This is despite the fact that the removal of ovaries causes loss of hormone secretion, requiring long-term use of HRT which is known to increase risk for breast cancer. To avoid this risk, women could take oestrogen-only HRT, but this would place them at higher risk for uterine cancer. So the attempt to reduce ovarian cancer risk leads to more surgical intervention: hysterectomy to prevent uterine cancer. The fear of ovarian cancer overrides all other considerations, including the health benefits of intact ovaries and the risks of surgery. Surveillance is considered, however, for women who have a desire for children. It would thus appear that assessments of cancer risk are still shaped by culturally rooted notions about the value of motherhood: ovaries can and will be spared if they fulfil a reproductive purpose.

One of the themes developed in this volume is the way in which national differences in patterns of specialization and healthcare organization have shaped the social and medical response to cancer. These differences have been most noticeable in the development of radiotherapy; in attitudes towards screening for cervical cancer, and in public discourses about cancer. In Britain the establishment of the Radium Trust and Radium Commission served to reshape cancer services in the country, leading to the centralization of therapy in specialist units, the separation of radiotherapy from diagnostic radiology and the emergence of radiotherapy as a distinct specialism within medicine. Radiotherapy in Britain became synonymous with cancer therapy. In the United States, on the other hand, radiotherapy was not so formative of the public image of cancer. American radiotherapy for the most part remained an appendage of diagnostic radiology, and American cancer hospitals continued to be dominated by surgeons. I have also talked about public health enthusiasm for screening in interwar America, as part of a move to take on chronic disease. British MOHs, who were already engaged in coordinating municipal hospital facilities, appropriating Poor Law hospitals and organizing health education campaigns, were reluctant to add to the burden by introducing mass screening. Furthermore, the introduction of screening programmes was at the expense of other medical uses of resources, and the costs involved not only those who carried out the tests, but also those who were responsible for the diagnosis and treatment of the disease discovered. The issue for the British, particularly after the introduction of the NHS, was whether the benefits of screening outweighed the costs. The prevailing view until the mid-1960s was that disease screening was not cost-effective. And in contrast to the United States, where aggressive cancer education programmes were welcomed as a means of stimulating demand in a ‘fee for service’ economy, educational efforts in Britain were dominated by the need to contain demand. Campaigns thus avoided addressing the lay public directly, and they were mostly low-key, local affairs.

In the early twenty-first century, public discourses about cancer continue to direct attention to breast, uterine and ovarian cancer as the greatest health threat women face. There is very little discussion about other cancers in women, particularly about lung cancer which is now the most common cause of female cancer death in the UK. Nor is there much discussion of cancer in men. Efforts to address the marginalization of men in cancer discourse are now focused on testicular and prostate cancer, to mirror public concerns about breast and cervical cancer. An example of this trend is provided by the Movember foundation, described on its website as a ‘global charity committed to men living happier, healthier, longer lives’. In addition to depression in men, the charity lists prostate and testicular cancer as its main areas of concern. Yet lung cancer is the most common cause of cancer death in men worldwide, and in the UK cancer incidence statistics show that it is the second most common cancer in men after prostate cancer. Gender-specific cancers may be easier to ‘sell’, but people’s low awareness of other common, non-gender-specific cancers, such as bowel cancer, suggests that there are evident hazards in targeting health measures.

In this volume I have developed the argument that cancer is a gendered disease. Gender constructs have influenced and defined both popular and medical understandings of cancer since ancient times. In the nineteenth century social concerns about women's role in reproduction were incorporated into medical discourses linking women, disease susceptibility and cancer. In the early decades of the twentieth century, groups concerned with the surgical treatment of women's cancers drew strength from maternalist policies which promoted women's welfare both at the workplace and in the home. In modern Western societies, gender ideology informs public perceptions of cancer risk, medical approaches to cancer and the production of various narratives about this disease. Understanding how social constructions of gender difference have shaped medical responses to cancer in the past may stimulate a more critical approach to current policies and practices, to the benefit of both men and women.

NOTES

1. Quoted in Reagan, 'Engendering the Dread Disease', p. 1784.
2. Szabo, *Incurable and Intolerable*, p. 53.
3. See e.g. Lewis, *What Price Community Medicine?*
4. Domenech and Castañeda, 'Redefining Cancer'.

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