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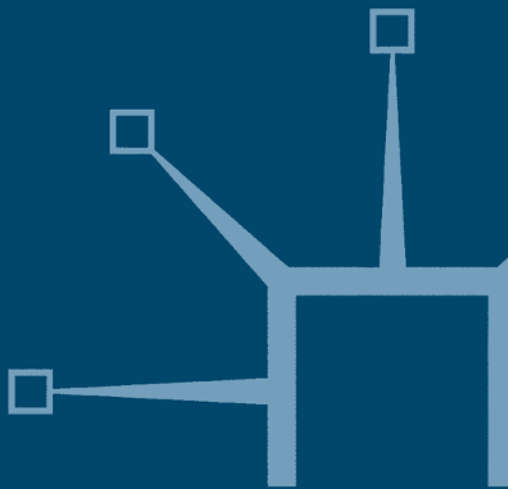
Hearts Exposed

Transplants and the Media in 1960s Britain

Ayesha Nathoo



Science, Technology and Medicine in Modern History

General Editor: **John V. Pickstone**, Centre for the History of Science, Technology and Medicine, University of Manchester, England (www.man.ac.uk/CHSTM)

One purpose of historical writing is to illuminate the present. At the start of the third millennium, science, technology and medicine are enormously important, yet their development is little studied.

The reasons for this failure are as obvious as they are regrettable. Education in many countries, not least in Britain, draws deep divisions between the sciences and the humanities. Men and women who have been trained in science have too often been trained away from history, or from any sustained reflection on how societies work. Those educated in historical or social studies have usually learned so little of science that they remain thereafter suspicious, overawed, or both.

Such a diagnosis is by no means novel, nor is it particularly original to suggest that good historical studies of science may be peculiarly important for understanding our present. Indeed this series could be seen as extending research undertaken over the last half-century. But much of that work has treated science, technology and medicine separately; this series aims to draw them together, partly because the three activities have become ever-more intertwined. This breadth of focus and the stress on the relationships of knowledge and practice are particularly appropriate in a series which will concentrate on modern history and on industrial societies. Furthermore, while much of the existing historical scholarship is on American topics, this series aims to be international, encouraging studies on European material. The intention is to present science, technology and medicine as aspects of modern culture, analysing their economic, social and political aspects, but not neglecting the expert content which tends to distance them from other aspects of history. The books will investigate the uses and consequences of technical knowledge, and how it was shaped within particular economic, social and political structures.

Such analyses should contribute to discussions of present dilemmas and to assessments of policy. 'Science' no longer appears to us as a triumphant agent of Enlightenment, breaking the shackles of tradition, enabling command over nature. But neither is it to be seen as merely oppressive and dangerous. Judgement requires information and careful analysis, just as intelligent policy-making requires a community of discourse between men and women trained in technical specialities and those who are not.

This series is intended to supply analysis and to stimulate debate. Opinions will vary between authors; we claim only that the 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 scientists, engineers and doctors, but to all who share the view that science, technology and medicine are far too important to be left out of history.

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Transplants and the Media in 1960s Britain

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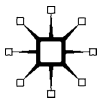

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In loving memory of my father, Karim Nathoo.

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Acknowledgements

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At the University of Cambridge, King's College and Clare Hall have both been exceptionally stimulating environments to be part of, and the Department of History and Philosophy of Science has been a uniquely exhilarating place to pursue my research. Its renowned spirit of intellectual vibrancy and amity was fostered by Peter Lipton, our deeply admired Head of Department, whose untimely and sudden death in November 2007 shocked and saddened all who were fortunate enough to have known him. I pay my sincerest respects to Peter for being a true inspiration to me ever since my formative undergraduate years.

I have benefited immensely from all those who have shared their thoughts and expertise with me and helped this work to develop. I am most grateful to Soraya de Chadarevian, Kelly Loughlin, Nick Hopwood, Jim Secord, Simon Schaffer, Tom Treasure and John Pickstone for taking the time to critically read through versions of this work in its near entirety, and I thank Emm Barnes for her encouragement at all the right times. Jerry Kutcher, Deborah Thom, Anne Digby, Tatjana Buklijas, Leila Nathoo, Sadiah Qureshi and Sasha Mudd helpfully commented on various parts and drafts. Any remaining oversights, however, are entirely my own.

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Archival access has been foundational to this project, and I extend my greatest appreciation to the librarians and archivists who have assisted me, including Lesley Hall from the Wellcome Library for the History and Understanding of Medicine, Kathleen Dickson from the British Film Institute, Christine Heydenrych from the Transplant Museum, Groote Schuur Hospital, Monica Thapar from the BBC Written Archives Centre (WAC), Dawn Moutrey and Tim Eggington from the Whipple Library, Department of

History and Philosophy of Science, Cambridge. Obtaining access to and permissions for images which are so central to my analysis has been no mean task, and I am extremely grateful to Dr Simon Joseph for greatly aiding this process by allowing me to reproduce a number of pertinent photographs he had taken in 1968 when Resident Surgical Officer at the National Heart Hospital in London.

Lastly, I wish to profoundly thank my mother, Razia, my brother, Irfan, my sister, Leila, and my beloved grandparents; Katie Hughes and my other dearest friends; and my soon-to-be husband, Mark Salim Maclean, for supporting, understanding and providing all that is most important in my life.

* * *

A note on sources

This book is a cultural history of the first human heart transplants in late 1960s Britain. It draws heavily on primary archival sources, most of which have not been used before by historians. My analytical framework is the relationship between medicine and the media in 1960s Britain, with 'medicine' representing 'high-tech' hospital medicine and its elite consultants, and 'media' primarily encompassing newspapers, magazines, journals and television.[1] Many extraordinarily rich hospital and government records held at the National Archives from the 1960s and 1970s have only recently become publicly available and have proved invaluable.[2] The BBC WAC also provided a wealth of important sources including news and programme transcripts, audience research and internal documentation. Only a fraction of audio-visual material has survived, but after years of perseverance, I was able to access some key television footage. Archives from the British Medical Association, the Institute of Cardiology and the Medical Journalists' Association, and papers left by the late Keith Ross, a member of the first British heart-transplant team, held at the Wellcome Trust's Archives and Manuscripts collection in London, have all greatly enriched this study.[3]

The transcript of a 'Witness Seminar' on 'Early heart transplant surgery in the UK' (Tansey and Reynolds, 1999) proved to be especially illuminating, coupled with the Seminar's uncatalogued archives. The event, held at the Wellcome Trust, London, in 1997, brought together a number of key medical figures, and I was fortunate enough to meet some of the participants during my period of research. In particular, Tom Treasure, the Seminar's Chairman, and Simon Joseph provided exceptional generosity with their time, sharing their insights into the institutions and professional environments most relevant to this study. Through Simon I had the pleasure of meeting his wife, Jacqueline, who had worked at the National Heart Hospital as an anaesthetist in the late 1960s, and I was also introduced to Jane

Somerville, Eunice Lockey and Donald Longmore, all of whom were directly involved in Britain's first heart-transplant operation. At a recent symposium in Cambridge, I had the opportunity to meet the renowned surgeon Sir Roy Calne who had pioneered liver transplantation in Britain. It was an unforgettable experience to meet these key protagonists with whom I had only previously been acquainted through copious documents and archives.

My work is also informed by a number of informal interviews I conducted with journalists who covered the transplant stories from the 1960s: Alan Massam, medical correspondent for the *Evening Standard*; Alf Browne, science editor for the Press Association news agency; James Wilkinson, science correspondent for the *Daily Express* (and later the BBC); and Ronald Bedford, science correspondent for the *Daily Mirror* and *Sun*. I also spoke to the South African photographer Don Mackenzie who closely assisted Christiaan Barnard. The richness of these unique, personal accounts has been of great value, providing important insights and perspectives that would otherwise have been lost. Unlike the medical professionals, journalists involved in the 1960s heart-transplant stories have rarely documented their own experiences.[4] As well as interesting recollections, the journalists also gave me advice, leads and access to other sources and contacts.[5] I rarely directly quote from my interviews, but the knowledge and experience I gained have provided me with a significantly greater understanding of the events of the time, and of the pioneering work and personalities that comprise the medical and journalistic terrains integral to my narrative.

The author and publishers wish to thank the following for permission to reproduce copyright material: Express Newspapers for a *Daily Express* advertisement in *New Scientist*, 20 February 1964, the front page of the *Daily Express* on 4 May 1968 and 31 May 1969, James Wilkinson's article 'Six times Patrick Ryan's heart was restarted' in the *Daily Express*, 6 May 1968, a cartoon by Michael Cummings, *Daily Express*, 12 September 1968; the British Heart Foundation for their advertisement in *The Times*, 6 August 1963; NI Syndication Ltd for the front page of the *Sun*, 4 December 1967, Ronald Bedford's article 'I'm feeling much better' in the *Sun*, 5 December 1967, the front page of the *Sunday Times Weekly Review*, 10 December 1967, a cartoon by Kenneth Mahood in *The Times*, 7 May 1968, and the front page of *The Times*, 29 May 1968; Mirror Syndication International for Cyril Kersh's 'And now folks – it's the Chris Barnard Show' in the *Sunday Mirror*, 4 February 1968, and the front page of the *Daily Mirror*, 30 May 1969; Solo Syndication Ltd for the front page of the *Daily Mail*, 4 May 1968; the Telegraph Media Group for the front page of the *Sunday Telegraph*, 5 May 1968; Pressdram Ltd for the cover of *Private Eye*, 5 July 1968; Getty Images for the cover of *Time*, 15 December 1967; Life Inc for the cover of *Life* magazine, 17 September 1971; Novartis for an image of Philip Blaiberg, November 1968; AA Publishing for a body-donation consent form printed in *Drive* magazine, New Year 1968; and the BBC for the image 'The heart is a very emotional

organ—Dr Barnard faces his critics', the *Listener*, 15 February 1968, and quotations of BBC staff and presenters from 1960s' programme archives and transcripts.

Every effort has been made to trace rights holders, but if any have been inadvertently overlooked, the publishers would be pleased to make the necessary arrangements at the first opportunity. All websites which are referenced were available at the given web addresses at the time that this book went to print.

Notes

1. Primarily for access reasons, but also to limit the otherwise endless sources, my research focuses on printed media and television, but largely excludes other sources such as cinema, newsreel and radio. I have generally omitted analysis of and reference to fictional sources – a major project in its own right – to focus on news and real medical practice.
2. Government records at the National Archives, located in Kew Gardens, are closed for a period of 30 years. Therefore documents from the late 1960s and early 1970s have only recently become accessible. I was granted permission to view one invaluable archive, 'National Heart Hospital: Relations with the press', a year before its public release. See references for a full list of archives used.
3. Unfortunately, there were archives which I eagerly sought that were not made available to me, for example those of the British Heart Foundation, and papers from Westminster's Coroners' Court detailing the coroner's inquest into the death of the first British heart-transplant recipient.
4. Transplant surgeons were interviewed by journalists at the time of the first heart transplants, and since then their stories have been told in autobiographies, speeches, documentaries, and more recently at the Wellcome Witness Seminar (Tansey and Reynolds, 1999). Although the media's involvement in the early heart transplants is constantly referenced in the Wellcome Witness Seminar, no journalists were invited to participate in this event. Gould (1985) and Thistlethwaite (1997) are exceptional in documenting journalists' own experiences at this time in relation to heart-transplant coverage in Britain.
5. Alf Browne arranged for me to meet with Alan Massam, who in turn allowed me access to his vast collection of *Evening Standard* clippings. Also of notable interest was an extract from Ronald Bedford's unpublished personal diary and an opportunity to speak to his wife, Thelma, who was a press officer for the British Medical Association in the 1960s.

Abbreviations

ABSW	Association of British Science Writers
BBC	British Broadcasting Corporation
BBC WAC	BBC Written Archives Centre
BHF	British Heart Foundation
BMA	British Medical Association
BMJ	*British Medical Journal*
CIOMS	Council for International Organizations of Medical Sciences
CMO	Chief Medical Officer
DHSS	Department of Health and Social Security
ECG	Electrocardiogram
EEG	Electroencephalograph
GMC	General Medical Council
GP	General Practitioner
ISD	Information Services Division
ITA	Independent Television Authority
ITN	Independent Television News
ITV	Independent Television
JAMA	*Journal of the American Medical Association*
MJA	Medical Journalists' Association
MoH	Ministry of Health
MRC	Medical Research Council
NHS	National Health Service
PR	Public Relations
PRO	Public Relations Officer
UCT	University of Cape Town
WHO	World Health Organization
WMA	World Medical Association

Introduction

> 'Barnard Faces His Critics', 9.00 P.M., 2 February 1968, BBC 1
>
> Well, sixty-two days ago, a new phrase hit the world headlines – heart transplant. At Groote Schuur Hospital in Cape Town, the world's first surgical operation to transplant a human heart was performed, by a surgeon virtually unknown except to a handful of other surgeons. After the praise came the criticism. At first it was no more than a murmur. Today it can be heard round the world .... As well as secular and religious protest, there were those which came from medicine itself. Soon it became clear that the medical world was divided .... The split is widest of all in Britain. Tonight, in London, before a gathering of doctors, lawyers, churchmen and journalists, Professor Barnard meets some of his critics.[1]

And so began a special episode of the BBC's *Tomorrow's World* programme, 'Barnard Faces His Critics', which changed the future of British medical–media relations. It was simply an unprecedented occurrence for a gathering of over 100 people, comprised mainly of medical professionals, to participate in a televised studio debate discussing the technical, social and ethical implications of a recent medical innovation. The issue at hand was one of the most controversial and famous operations of the twentieth century – human heart transplantation – first performed by the South African surgeon Christiaan Barnard on 3 December 1967.

Popular twentieth-century histories often single out this surgical endeavour as a great or defining moment in world history, as important as the moon-landing of 1969.[2] On a par with space travel, it has been frequently used to symbolize human ability and medical achievement. Yet, for all this recognition, the academic literature lacks a historical analysis of this celebrated medical feat in its wider cultural context.

Barnard's operation inaugurated 'the year of the heart transplant', in 1968, when over 100 transplants were conducted in 18 different countries.[3] The first heart transplant in Britain took place in May 1968. Around 300

operations are now performed in Britain each year and while economic factors of course affect policy decisions, the most significant, publicly stated, limiting factor is the shortage of donor organs.[4] Doctors, health authorities and charities persistently urge the public, through vast media campaigns, to sign donor cards to give others the 'gift of life', with the heart often portrayed as the greatest gift of all.[5] However, the transition from experimental surgery to routine therapy was neither smooth nor inevitable. After the initial burst of activity in the late 1960s, with most of the early recipients dead within weeks of their surgery, human heart transplantation was all but abandoned for a decade. This book takes a close look at the first wave of heart transplants, between 1967 and 1969, and asks what made these operations possible and then why they stopped.

The first heart transplants were as much media as medical events. As the transplant surgeon Roy Calne wrote in 1970, 'The first heart grafts were covered by press, radio and television on a scale equivalent to the news of the outbreak of a major war.'[6] That they received unprecedented coverage for a medical undertaking has been frequently noted, but there has been no prior attempt to synthesize medical and media histories.[7] The media involvement in the heart transplants has generally been considered to be a mere supplement to a primarily medical story, rather than an integral and influential part of the history.

Some doctors retrospectively blame the intense, initial celebratory reporting for creating 'national surgical chauvinism and an ego epidemic' amongst heart surgeons, leading to the 'flurry of transplantations' in 1968.[8] Later critical media coverage is also often mentioned, as well as the fact that there was a moratorium, but no connection is made between the two. The initial high mortality rates are assumed in themselves to have been enough to discourage surgeons from continuing with the operation.[9] Yet a different explanation seems to be warranted given that many other types of cardiac surgery, as well as other transplant operations, prior to heart transplantation, had similarly high initial mortalities but continued as justifiable therapies.[10] The role of the media here seems critical. The media made the first heart transplants so symbolic and brought the actors and issues fully into the public arena: it created surgeon and patient celebrities, framed the ethical and socio-economic questions and, I argue, was central to bringing about the moratorium.[11]

The extensive reportage not only had a profound effect on the heart-transplant programme, but, conversely, the operations significantly impacted on medical communication more generally. They affected how, where and by whom medicine was debated. Professionalized medicine received exceptional exposure and has never since been able to retreat out of the public eye. Nowadays doctors are willing and expected to deal with continual, often critical, media interest and commentary on the social, ethical, economic and therapeutic implications of medical innovation, and public

involvement in medical debate is assumed. Expectations and demands of both medical and media consumers significantly changed in the late 1960s and the heart transplants were not only indicative but also constitutive of those transformations.

Despite being an era in the West of increasing affluence, consumerism, education, economic stability and social liberalism, the late 1960s were politically volatile years when post-war optimism was already giving way to a sceptical, anti-authoritarian individualism. While people across the social spectrum could afford and accepted domestic technologies such as televisions, fridges and washing machines, this period also witnessed growing public disillusionment with an increasingly 'high-tech' society. Given that transplantation was symbolic of high-tech medicine as a whole, and heart transplantation was the 'ultimate' surgery, this book demonstrates the need for a greater historical recognition of the operation's social and political significance.[12] The first wave of heart transplants marked a decisive period in post-war history, when the public's trust in their doctors was significantly undermined and when medicine was held publicly to account as never before.[13]

The history of heart transplantation is international but each country has its particularities, and the focus here is on Britain. By the late 1960s, the National Health Service (NHS) was well established within the welfare state and expectations of medicine were high. Britain was home to many world-class cardiac and transplant surgeons with international reputations. The British national press and public service broadcasting were also globally respected at a time when television was becoming an increasingly pervasive part of everyday life. The heart-transplant controversy was fought out in the international arena, among a divided medical world, but as the opening of 'Barnard Faces His Critics' revealed, British medical opinion was especially polarized. Given the significance of British media and medicine at a time when both fields were becoming increasingly internationally connected, the focus on Britain contributes to building up a broader picture, with local medical–media relations, intricacies and negotiations representing the wider scene.

By the 1960s the media had become an exceptionally important component of the contemporary social and political fabric.[14] This was an increasingly media-conscious era offering immediate information and entertainment; protests and wars became more and more visible and the media provided a platform for issues to be raised and opinions heard by vast and disparate audiences. Yet medical communication at this time has barely been looked at historically.[15] The relatively small range of historical literature on medicine and the media that does exist is mainly focused on the United States;[16] none focus on heart transplantation except some journalistic accounts which tend to contain rich narratives but lack analytical rigour.[17]

Most existing histories of heart transplantation are written by doctors and generally focus exclusively on technical achievements (and occasional setbacks) in a linear and progressive manner.[18] If the media is mentioned at all, it tends to be seen as an unfortunate by-product of the extraordinary surgical undertaking, and little attention is paid to social or political contexts, patient experiences, public responses or wider social consequences. It is through considering situations involving real communities, contexts and implications that anthropologists have produced some of the most insightful studies of organ transplantation thus far.[19] This book brings Britain into the picture, providing a useful comparison to work mainly conducted on the United States, whilst giving a historical analysis that complements existing ethnographies. *Hearts Exposed* provides a revised history of early heart transplantation that takes medicine and the media as products of the same, specific socio-cultural milieu of the late 1960s, thereby understanding media processes and events as an inseparable dimension of the medical history.

* * *

Chapter 1 starts by unfolding and interpreting the technical, institutional and conceptual shifts, which allowed the human heart to become a transplantable organ by 1967. It is a medical historical account which, while acknowledging the technological and clinical advances prior to heart transplantation, differs from standard, teleological histories of cardiac transplantation. The formation of cardiology as a discipline, the emergence of cardiac surgery and the eventual transplantation of a human heart were not inevitable developments. They were the result of a time-specific set of attitudes and conditions that generated optimism and confidence in 'heroic' surgery, giving surgeons and patients alike, as Fox and Swazey (1974) remark, the 'courage to fail'.[20] By the mid-1960s, *Time* magazine could run a lead article on surgery announcing to its readers: 'If they can operate, you're lucky'; and cardiac surgeons could claim that human heart transplantation was a surgical possibility and near reality.[21]

Quantitative research has shown that over the last 30 years medical science has increasingly become paradigmatic of all scientific enterprises in contemporary media reports, with biomedical news being the dominant form of science news.[22] Much of the academic literature on medical and science communication does not distinguish between the two – medicine is generally considered part of science reporting and not a special case.[23] However, as Chapter 2 demonstrates, medical and science reporting have quite different histories, constraints and issues, pertaining to professional ethics and the doctor–patient relationship. The context of medical news-making has varied significantly throughout the twentieth century. There have been changes regarding who reports news, what is considered news, how and

through whom information is managed and acquired, medical and media consumer expectations, and types and uses of available communication forms and medical technologies. It is precisely such contextual differences that much of the existing 'health studies' and 'cultural studies' literature tends to bypass, but that a medical historical approach seeks to highlight.[24] The second chapter therefore explores changes in the media landscape in Britain that facilitated and shaped coverage of heart transplantation. I show how organizational changes within the media, new styles of reporting and new media influenced medical news-making – including the creation of specialist medical journalists, the increasing use of investigative journalism and the rise of domestic television.

Even though the recipient of the first human-to-human heart transplant, Louis Washkansky, survived only 18 days, his operation of 3 December 1967 was simultaneously hailed in the media as historic and a success. Chapter 3 seeks to understand what made the Cape Town operation into such a media wonder and how Barnard and Washkansky were transformed into international celebrities. How did the coverage follow or break with previous trends in reporting medical 'breakthroughs' and how did it inform subsequent expectations of medical news reporting? This chapter aims to show how and why the first human heart transplant was made into one of the most famous events of the twentieth century.

Criticisms of heart transplantation began to emerge in the British media after three transplants in the United States left the patients dead within days, and a second transplant in South Africa which controversially used a 'coloured' donor for a white recipient. Opponents claimed that the transplants were premature, that immunological knowledge was lagging behind surgical ability, that inappropriate publicity had attended the operations and that major ethical issues needed immediate attention. Analyses of the ethics of transplantation have generally been the terrain of 'bioethicists' who have focused on issues such as identity, selfhood, allocation of organs, the nature of death, individual and societal rights, duties and consent.[25] As Cooter (1995) has noted, histories of ethics compose only a tiny fraction of the vast mainstream bioethical literature,[26] mainly because philosophical logic is often used by bioethicists to help resolve universal moral rights and wrongs that are by definition ahistorical.[27] Chapter 4 situates the early concerns about heart transplantation in their historical context through a micro-study of the *Tomorrow's World* studio debate in February 1968, 'Barnard Faces His Critics'. The chapter analyses the background to, and the content and reception of, this unique programme, highlighting major concerns as to where medicine should be debated, and who should take part. This programme, I suggest, shaped the ensuing heart-transplant debate in Britain, broke down traditional rules regarding doctor anonymity, and helped to shift the focus of medical programming to explore social and ethical implications of medical innovation.

Chapter 5 analyses the interface between medical and media worlds at the time of the first British heart transplant in May 1968. As the heart operation was made into a media drama and human interest story, the surgeons' mismanagement of the publicity became part of the news story itself, forcing media–hospital relations to the top of the agenda. This was the first time that British hospital doctors gave a post-operative press conference. How did the issues framed in the press relate to the disparate professional interests and ethics of doctors and journalists? How did the public and private worlds of the media and hospital intersect and interact? This chapter argues that the transplant stories played a powerful part in defining the media's role in this internationally tumultuous time, and challenges some of the surgeons' own accounts that describe the media involvement as entirely unwelcome and imposed.

Chapter 6 looks at the formation of committees, the hiring of Public Relations (PR) firms, the informal meetings and international conferences, all aimed at regulating and controlling the heart-transplant enterprise, and, most importantly, trying to combat the growing public distrust of the medical profession. Of the first 100 heart-transplant patients in 1968, two-thirds were dead within three months of their revolutionary surgery. Was heart transplantation high-tech medical progress or human experimentation? Was taking out a beating heart in fact an act of murder given that the beating heart was the traditional signifier of life and death?[28] The need for image management became increasingly apparent as doctors tried to contain the heart-transplant controversy. The first heart transplants were not, of course, the first time that medical authorities lacked consensus or that a new medical procedure had a high initial mortality rate. The difference here was the degree and duration of media attention that exposed the medical divide and made the deaths of heart recipients headline news, rather than just statistics in medical journals.

After three unsatisfactory attempts at heart transplantation in Britain, in 1969 the operation was essentially stopped for a decade as part of a more general international clinical moratorium. Heart transplantation was no longer seen as a sign of hope and a brilliant medical achievement, but a premature, desperate attempt to prolong the life of a few individuals. There were diverse reasons for this abandonment, including a lack of donors and high mortality rates of recipients, but I foreground the crucial role of the media in bringing to a close the first wave of human heart transplantation in Britain.

1
Making the Heart Transplantable

How, by 1967, had human heart transplantation become conceivable, desirable and practicable? Even in the mid-1950s, it was not obvious that the heart could be transplanted, or indeed that it should be. The organ had to become a distinct object of study with corresponding institutional, financial and intellectual support and to be conceptualized as not just repairable but also replaceable. Performing the operation required not only surgical ability but also a certain heroic attitude and a new relation to technology that was present amongst surgeons in the post-war era. Of equal importance, and inextricably linked to technical innovations, were institutional and cultural shifts that made human heart transplantation achievable. In the early twentieth century, a new set of establishments, practices and professionals formed the field of cardiology based on a functional understanding of the human heart; but only after the Second World War did therapeutics significantly change, with cardiac surgery emerging as a discipline distinct from cardiology, and new technologies such as the heart–lung machine allowing surgeons the time and means to operate on the heart.

The heart–lung machine, also known as the 'pump–oxygenator', embodied the dominant medical model of the heart, conceptualized in terms of its function as a 'pump'. Yet, surgeons were aware of widespread resistance to the notion of the heart as a mere 'pump' and at times acknowledged the limitations of this reductionist analogy. However, by focusing on this functional aspect, a diseased heart could be understood as just a failing pump which could therefore be replaced with something functionally similar. This was the impetus for 'spare-part' surgery which incorporated artificial organs, xenotransplantation (animal-to-human) and human-to-human organ transplantation.

The history of cardiac transplantation must also be placed in the wider context of organ transplantation, post-war surgery and immunology, and the attitudes, influences and aspirations of surgeons of the time. The first dog heart was transplanted into the neck of another dog in 1905; but although influential, an inevitable extrapolation cannot be made from this

experiment to late twentieth-century routine therapeutic heart transplantation using 'brain-dead' human donors, as some histories would suggest. Many of the early experiments aimed to further physiological understanding rather than having any directly therapeutic goal in mind. By the early 1950s, certain researchers did have primarily therapeutic aims, yet transplanting the human heart was still considered 'a fantastic dream'. By the mid-1960s this dream was deemed by leaders in the field to be 'just around the corner', although not without resistance amongst the medical profession and the wider public as the idea was disseminated.

The heart-transplant pioneers were poignantly aware that the shift from animal experiment to human clinical procedure was an enormous step, ethically and psychologically, as well as technically, and there was no consensus even within medical circles that heart transplantation should be attempted. In 1964, when the American surgeons Norman Shumway and Richard Lower felt confident that the procedure was feasible, their key reservation was the societal response to such an audacious act. In the mid-1960s, heart disease was regularly presented as the 'number one killer', in the Western world; and at a time of high expectations of medical and scientific innovations, the public were familiar with reports of surgical advance. However, it was not until November 1967 that cardiac surgeons publicly declared that human-to-human heart transplantation was not only possible but imminent. This chapter thus traces how the heart was made transplantable by the end of 1967: transformed from a vital organ that could not be surgically touched, to a replaceable 'pump' – transplantable from one human being to another.

The 'pump': Its disciplines, institutions and professionals

By the end of the nineteenth century, physicians were reconceptualizing the heart in terms of its functional capacity as opposed to its anatomy. With increasing technological means, nineteenth-century experimental physiology created the 'living heart' whereby cardiac disease could be measured and diagnosed in terms of changes in function rather than structure.[1] Built on earlier instrumentation, electrocardiogram (ECG) recordings became *the* medically symbolic representation of the beating heart, showing function and dysfunction, allowing harmful rhythmic abnormalities to be differentiated from harmless disturbances.[2] Making electrocardiography a dominant method for investigating and treating heart disorders contributed to establishing the hospital as the principal site for medical treatment, part of a larger story that included, for example, the introduction of X-ray imaging and antisepsis in hospitals.[3]

In the years building up to the First World War, cardiology formed as a discipline in its own right. It was consolidated during the war, becoming a respectable speciality by the 1920s. Notably, the condition 'soldier's heart',

previously DaCosta's syndrome, was determined and resolved using the new cardiology. Symptoms that had been considered indications of heart disease, such as chest pain and palpitations, were reframed as psychological problems treatable through graded physical exercise.[4] From 1922, when the Cardiac Club was founded, Britain had a club, a journal (*Heart*, formed in 1909), and a hospital dedicated solely to patients suffering from heart disease.[5] Founded in 1857, the eight-bed 'Hospital for Diseases of the Heart' was the first in the world solely for patients with heart conditions.[6] In 1914 it moved to Westmoreland Street, London, and expanded to 42 beds, becoming a centre for First World War recruits with heart problems. During the mid-twentieth century it grew into one of the leading international cardiac centres and in 1968 would be the site of Britain's first heart-transplant operation.

In the 1920s, this specialized institution, combined with specialized technology, journals and clubs helped to form cardiology as a coherent intellectual discipline.[7] The medical historian Christopher Lawrence has argued that the very concept of a 'heart attack', a phenomenon that was subsequently designated a primary killer in Western societies, was constructed in the 1920s by specialist practitioners furthering their field. They negotiated a consensus over how their instruments could be interpreted so as to objectify and define disease.[8] A particular interpretation of an ECG recording thus became the objective indicator of a 'heart attack' and by the early 1930s, coronary thrombosis (clotting of the heart's arteries) had become an unambiguous disease entity.

In the Aristotelian view, the heart was not only the seat of the soul but also a privileged organ that did not suffer disease.[9] With the development of cardiology as a discipline, the belief that the heart could not suffer disease had clearly given way; however, what remained into the early twentieth century was the conviction that the heart could not be surgically touched, and the patient survive, given its essential, determinant role of maintaining life with each beat. Leading late-nineteenth-century surgeons maintained that surgery of the heart would always remain impossible;[10] surgery of the brain, in contrast, was already quite well advanced by the early twentieth century,[11] as the basal function of the central nervous system was sufficient to keep essential physiological control of respiration and circulation, provided the heart and lungs were in working order. The converse was not true: failure of circulation and/or oxygenation brought death within minutes.

Against the prevailing climate of opinion, the London surgeon Henry Souttar wrote in 1925, 'the heart is amenable to surgical treatment as is any other organ', reporting on an isolated operation he had conducted on a patient suffering from mitral stenosis (the narrowing of the valve leading to the left ventricle, the main pumping chamber of the heart).[12] Although the patient lived for several years after the operation, Souttar's colleagues scorned the very idea of operating on the heart, considered the valves to be of little importance to heart disease, and referred him no more similar

cases.[13] Meanwhile, in Boston during the 1920s, the surgeon Elliot Cutler led a series of nine operations for mitral stenosis, using a different method to Souttar, but almost all the patients died within days of their surgery, discouraging Cutler from continuing with the procedure. Nonetheless, these operations marked the start of 'blind' or 'closed-heart' surgery, initiated before the use of blood transfusions and antibiotics, and abandoned not because patients died of haemorrhage or infection, but due to the general lack of belief in and support for operating on the heart.[14]

Cardiac surgery did not properly commence until the 1940s; the Second World War was the major impetus for change, as adventurous surgeons attempted experimental surgery on the numerous and varied war injuries of otherwise 'fighting fit' young men. The US Army surgeon Dwight Harken, based at a military hospital in Cirencester, West of England, notably reported in 1946 over 130 cases in which he had removed shrapnel and bullets lodged in and around the heart (13 within the heart's chambers), without a single death recorded.[15] Wartime operations therefore definitively proved that the heart was in fact a resilient organ that could be interfered with, damaged and mended. Closed-heart operations began to be performed with increasing frequency and success during the 1940s, and by the early 1950s, with the development of perfusion techniques and hypothermia, open-heart surgery became technically feasible. The heart could now be accessed, seen and operated on, rather than being exposed for the first time during autopsy in its static, often diseased, state. The development of antibiotics, new technologies of imaging and measurement, and advances in blood coagulants and transfusions contributed greatly to increased surgical survival rates. Although experimented with even in the nineteenth century, and undertaken during the First World War, blood transfusions only became a co-ordinated, safe and effective procedure in Britain when the National Blood Transfusion Service was established in 1946.[16]

After the Second World War, the Hospital for Diseases of the Heart was designated as a postgraduate teaching hospital, renamed the National Heart Hospital and assigned its own Board of Governors. The Institute of Cardiology was founded in 1947, attached to the hospital for purposes of postgraduate education and research.[17] Cardiology had become an institutionalized and respected field, making increasing demands on Medical Research Council (MRC) funding in the post-war years. But dissatisfied with the amount of money, members of the British Cardiac Society and the Chest and Heart Association initiated the British Heart Foundation (BHF), officially established on 20 July 1961. The Chest and Heart Association had developed from the late-nineteenth-century National Association for the Prevention of Tuberculosis, but as heart disease took over from TB as a greater threat to Western lives in the 1950s, the association changed its focus.

The BHF was set up to raise funds primarily to 'undertake and promote medical and scientific research relating to diseases of the heart and

circulation . . . and to promote postgraduate medical training in cardiology'. The secondary objective was to 'promote through the Association . . . the welfare and rehabilitation of patients who have suffered from heart disease, and health education in subjects relating to the heart and circulation'. Public education, however, was sidelined, at least in the first few years, perhaps since there was an initial agreement that the Chest and Heart Association would undertake this task and also due to 'uncertainty over what it was appropriate to tell the public'.[18] On 11 June 1963, the Foundation launched its high-profile public appeal with a press conference held at the headquarters of the Royal Society. An article in *New Scientist* magazine two days later asserted that 'the MRC are not giving enough . . . we [the BHF] are therefore compelled to appeal directly over the head of government to the interested and charitable public for a large amount of help with a problem of great magnitude and of great personal importance to everybody'.[19]

By the 1950s, cardiac surgery had formed as a distinct field, separate from cardiology, developed mainly by thoracic surgeons who had originally been involved in treating tuberculosis. In 1947 the Brompton Hospital, which specialized in pulmonary disease, appointed its first pure cardiologist. That same year, Thomas Holmes Sellors initiated cardiac surgery at Harefield Hospital in Middlesex (which had also originally been built as a chest hospital primarily for tuberculosis) and Guy's Hospital opened a thoracic surgical unit. These London hospitals were some of the world's leading centres, making headway with diagnostics and treatments for valvular, ischaemic (blood-obstructing) and congenital heart disease.[20]

After the war, surgery became increasingly specialized yet also collaborative. Artificial replacement therapy, for example, required collaboration not only across the experimental sciences but also with electronics and materials industries.[21] Both cardiac surgery and transplant surgery also relied heavily on a constellation of medical techniques and disciplines. A 1965 speech by Holmes Sellors on 'The genesis of heart surgery' pointed out that cardiac surgery had been virtually unknown 25 years previously. He described the rise of post-war surgery of the heart with aggressive language, as a 'therapeutic weapon' which emerged with almost 'explosive violence', but acknowledged that the growth of the field was due to team efforts and the culmination of work in various medical areas from haematology to anaesthesia to nursing. The talk ended dramatically: 'Man – the surgeon – is no longer a demi-god in complete control. He is the leader and co-ordinator of a complex. No one unit, no one country, has the sole credit for the evolution of this fascinating branch of surgery.'[22] Such an explanation is indicative of the post-war notion of a bio-medical complex, where groups, networks and centralised co-ordination and funding were seen as the desired format for medico-scientific development. This mentality followed on from the success of the large-scale, highly co-ordinated development and manufacture of

penicillin, the 'magic bullet', seen as medicine's equivalent to the Manhattan Project.[23]

Holmes Sellors was the first consultant surgeon appointed at the National Heart Hospital in 1957 (also lecturer at the associated Institute of Cardiology), but surgical practice did not commence at the hospital until 1962 when two operating theatres were built at the Westmoreland Street site.[24] During the 1960s it became a world famous cardiological institution; its moment of greatest exposure was to come in May 1968 when the first British heart-transplant operation was performed there by Donald Ross and his team. Ross was born in South Africa, but moved to Britain in the early 1950s where he spent his entire professional life. He joined the National Heart Hospital in 1963 and became perhaps Britain's most eminent cardiac surgeon, renowned particularly for his work on valve replacement.[25] In the 1950s and 1960s, London's Hammersmith Hospital also led the way in cardiac surgery in Britain, particularly due to the work of the surgeon William Cleland and clinical physiologist Denis Melrose. In 1953 they developed a heart–lung machine, probably the most significant technical contribution to open-heart surgery, that took over the circulation and oxygenation of the blood.[26] Two years later they succeeded in performing an elective cardiac arrest. Significantly, the non-beating heart was here not a marker of death, but a transitory and intended event, which enabled its surgical repair.[27]

Mid-twentieth-century medical terminology can be seen to reinforce the mechanistic notion of the body that dates back to the Cartesian concept of the body as a machine.[28] With the heart seen as analogous to a pump, much of the 1950s medical literature referred to the heart–lung machine as a 'pump–oxygenator'. However, it was not clear what type of a pump the heart was, as can be shown by the array of different heart–lung machines that were developed. There was the Gibbon–Mayo machine that used 'roller pumps' and another device which used 'sigmamotor pumps'.[29] Oxygenators could be of the 'rotating disc' type or 'bubble oxygenators'. Pumps could be disposable or non-disposable, portable, of different sizes and efficiencies, in need of cleaning and sterilization. But regardless of the designs, the function was essentially the same: pumping and oxygenating blood – the basic functions of the heart and lungs.

Unlike the heart and lungs, however, the pump–oxygenators damaged blood cells. Despite the overwhelmingly positive reception of heart–lung machines, it was widely acknowledged in the 1960s that they caused numerous post-operative complications.[30] The foreword to Melrose's paper, written by another Hammersmith consultant, Ian Aird, stated that in lab experiments, animals can rarely survive indefinite time spans on an extracorporeal heart–lung circulation, and openly claimed that 'the natural lung may have other functions than oxygenation'.[31] Perhaps then too, the heart had other functions than pumping.