

## Introduction

**N**ever have people in the West lived so long, or been so healthy, and never have medical achievements been so great. Yet, paradoxically, rarely has medicine drawn such intense doubts and disapproval as today. No-one could deny that the medical breakthroughs of the past 50 years – the culmination of a long tradition of scientific medicine – have saved more lives than those of any era since the dawn of medicine. So blasé have we become about medical progress, that it is worth taking stock of just some of the tremendous innovations taken for granted today yet unavailable a century or two ago. These advances are discussed and explained at length in the chapters that follow. By way of introduction, here is a brief summary of the most dramatic changes that have occurred during the second half of the twentieth century.

At the outbreak of the Second World War, penicillin was still at the laboratory stage and remained rationed for several years. Before the advent of such antibiotic ‘magic bullets’, pneumonia, meningitis, and similar infections were still frequently fatal. Tuberculosis – dubbed the ‘white plague’ to contrast it with the Black Death (and because sufferers had a characteristic pallor) – was long the single most important cause of death in the developed world. But that was given the *coup de grâce* by the introduction of the BCG vaccine and streptomycin in the 1940s. The 1950s extended the ‘first pharmacological revolution’ on to a broad front. The new biological drugs beat the bacteria, improved the control of deficiency diseases, and produced effective medications (such as the psychotropic drug

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chlorpromazine) for mental illnesses. The first vaccines against polio arrived at the same time.

Other drug breakthroughs, notably steroids such as cortisone, made it feasible to capitalize on the growing understanding of the immune system. By tackling the rejection problem, the development of immunosuppressants opened up vast new fields for plastic and transplant surgery. Cardiology also blossomed. One milestone was the first surgical intervention in 1944 for 'blue babies' born with congenital heart disease; thereafter, paediatric cardiology forged ahead. Open-heart surgery dates from the 1950s; bypass operations, another leap forward, began in 1967.

By that time, surgery was beginning to resemble space travel, and it was also capturing the public's imagination; it seemed to know no bounds. Organ replacement was developed, first with kidneys. Transplants became banner headlines in 1967 when Christiaan Barnard sewed a woman's heart into Louis Washkansky, who lived for 18 days. By the mid-1980s, hundreds of heart transplants were being conducted each year in the USA alone, with two-thirds of the recipients surviving for 5 years or more. During the past 50 years, surgery has not just grown: its nature has been transformed. Early in the twentieth century, its essence lay in extirpation: locate the lesion and cut it out (often effective but rather crude). Now, its philosophy has become far more sophisticated: that of continuous repair and (perhaps endless) replaceability.

Alongside these practical leaps forward in intervention, science has been contributing to healing. Such technological breakthroughs as electron microscopes, endoscopes, computerized axial tomography (CAT), positron emission tomography (PET), magnetic resonance imaging (MRI), lasers, tracers, and ultrasound have created a revolution in medicine's diagnostic capacities. Lasers brought microsurgery. Iron lungs, kidney-dialysis machines, heart-lung machines, and pacemakers have all taken their place in medicine's armoury. Meanwhile, research in basic science has transformed our understanding of the body and its battles with disease. In particular, genetics and molecular biology developed rapidly after Francis Crick and James Watson's discovery of the double-helical structure of DNA and the cracking of the genetic code in 1953. Genetic screening and engineering have been making great headway. At the same

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time, brain chemistry opened new horizons for medicine: research on endorphins has been laying bare and mastering the secrets of pain; synthetic manipulation of neurotransmitters such as L-dopa has provided treatments for Parkinson's disease and other disorders of the central nervous system. So long a Cinderella, clinical science – the application of scientific methods to the actual experience of sickness – has come into its own, thanks partly to the randomized clinical trial, developed from the mid-1940s.

Such advances in science and therapeutics have not blossomed in a desert. They have arisen from the vast endowment of medicine as a social utility (discussed in Chapter 9). In the UK, the creation of the National Health Service (NHS) in 1948 remains a red-letter day, but nations worldwide have been devoting ever larger public and private resources to medicine. In the USA and several European Union nations, more than 10 per cent of gross national product now goes on health. The World Health Organization (WHO) continues to expand. Its programmes of disease prevention and eradication, especially in developing countries, have had some striking successes, notably the global eradication of smallpox in 1977.

To put developments in a nutshell, two facts give powerful (if conflicting) evidence of the growing significance of medicine. First, the doubling of world population in the past 50 years (from around 2,500 million in 1950 to an estimated 6,250 million in the year 2000), no small percentage of which has been caused by new medical interventions and preventions. Second, the introduction of the contraceptive pill, which, in theory at least, paved the way for a safe and simple means to control that population. These developments are well known, but familiarity does not detract from the achievement. Many revolutions have occurred in human history – the introduction of agriculture, the growth of cities, printing, the great scientific advances in the seventeenth century, and the industrial revolutions. But not until the last half of the twentieth century has there been a medical revolution with dramatic therapeutic implications, if we take as our yardstick the dependable ability to vanquish life-threatening disease on a vast scale. The healthiness and longevity of the rich world, and the populousness of the poor world, alike attest this.

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A major aim of this volume is to set those changes in medicine in their historical context. We trace the long tradition that arose out of Ancient Greece, which first set medicine on a rational and scientific foundation. We examine the transformations stimulated by the Renaissance and the Scientific Revolution, which presented medicine with the triumphs of physics and chemistry. And we consider the remarkable contribution of nineteenth-century medical science, with its advances in public health, cell biology, bacteriology, parasitology, antiseptics, and anaesthetic surgery. Major advances were made early in the twentieth century: X-rays, immunology, the understanding of hormones and vitamins, chemotherapy, even psychoanalysis.

As the following chapters show, a historical understanding of medicine is far more than a cavalcade of triumphs. It involves the attempt to explain the more distant and indirect antecedents of modern changes, to show why one path was taken and not another, to examine the interconnections of the theoretical and practical aspects of medicine, science, and healing, and doctor and patient; to analyse the relations between the broad trends and leading individuals; and, not least, to lay bare the thinking – often to our minds bizarre and unscientific – that lay behind the physiological and therapeutic systems of the past.

But *The Cambridge History of Medicine* also attempts to go beyond simply telling the story of the rise of medicine and its interplay with science, society, and the public. It aims, through historical analysis, to put medicine under the microscope, and to raise questions about the great forces that have fuelled medical change over the centuries and continue to do so. Who has controlled medicine? Has it been shaped by supply or by demand, by money and market forces? How adequately has it met the needs of the sick? How responsive has it been to the wishes of the medical profession? What has been the role of the state in financing and directing healing?

The volume thus poses questions about medicine's social and political roles. For if healing has, obviously, been medicine's task, has it also had hidden programmes, which, as some critics have alleged, may have an unsavoury side? The involvement of German doctors and scientists with the Nazi final solution, from unethical

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and deadly human experimentation to the supervision of the gas chambers at Auschwitz and elsewhere, needs to be remembered alongside the selfless dedication of innumerable other physicians and health professionals. Partly by way of recoil from the atrocities of the Second World War, doctors have been conspicuous in humanitarian movements during the past 50 years, including campaigns for nuclear disarmament and against torture.

Questioning the roles of medicine is important, not for any cynical reasons but because if we are to understand the directions medicine is taking now – its priorities, funding, and regulation – it is crucial that we have a historical perspective on how it has come to be. That is why it is helpful to return to the paradoxical state of medicine today.

In spite of all the tremendous advances, an atmosphere of disquiet and doubt now pervades medicine. The flag-waving optimism of the 1960s has disappeared. Euphoria bubbled up over penicillin, over the coming of heart transplants, and over the first test-tube baby, Louise Brown, in 1978. Now, fears are growing over the strange powers that medicine might assume as genetic engineering and biotechnology expand. At the same time, as health costs get out of hand, prospects loom of real medical cutbacks in major Western societies. Will the development of scientific medicine make it unaffordable to many people? Will it succumb to an inverse square law – growing costs and complexity entailing diminishing utility?

Now that the big battles have been won, medicine is more open to criticism. Setbacks, major and minor, naturally do not help. For example, thalidomide proved disastrous; iatrogenic (doctor-caused) illness has grown; research on cancer, schizophrenia, multiple sclerosis, Alzheimer's, and other degenerative diseases creeps forwards at a snail's-pace; and doubts remain about the medical basis of psychiatry. In Britain, the NHS has been turned into a political football and faces disintegration or possible dismantling; in the USA, insurance and litigation scandals dog the profession. In rich countries, the needy still get a poor medical deal. In the developing world, for lack of international will, malaria and other tropical diseases remain rampant, while diphtheria and tuberculosis, once thought to have been routed, are resurgent in the former USSR and other industrialized nations. Not least, the pandemic of AIDS (acquired

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immunodeficiency syndrome) destroyed any naive faith that disease itself has been conquered.

Medicine is arguably going through a serious crisis, one that is in large part the price of progress and unrealistically high expectations that have been whipped up by the media and indeed by the medical profession itself. Medicine may appear to be losing its way, or rather having to redefine what its goals are. In 1949, in an article in the *British Medical Journal*, the distinguished physician Lord Horder posed the question: 'Whither Medicine?', and returned the answer direct: 'Why, whither else but straight ahead'.<sup>1</sup> Today, who even knows where 'straight ahead' lies?

For centuries, the medical enterprise was too paltry to attract radical critiques of itself. It had its mockers, yet those who could invariably called the doctor when sick. As Edward Shorter suggests in Chapter 4, in what might paradoxically be called the good-old-bad-old-days, things were simple: people did not have high expectations of medicine, and when the Old Doc typically achieved rather little, his patients did not blame him too much. Medicine was a profession, but it carried no great prestige and had rather little power. In the twentieth century, by contrast, medicine has claimed greater authority, and has become immensely costly. Once medicine grew mighty, it drew critics. And once it proved effective, the scourge of pestilence was forgotten, and the physician became exposed to being viewed primarily as a figure of authority, the tool of patriarchy, or the servant of the state.

In one other key respect, medicine has become the prisoner of its own success. Having finally conquered many grave diseases and provided relief for suffering, its goals have ceased to be so clear and its mandate has become muddled. What are its aims? Where is it to stop? Is its prime duty to keep people alive as long as possible, whatever the circumstances? Is its charge to make people lead healthy lives? Or is it but a service industry, to fulfil whatever fantasies its clients may frame for their bodies – for instance, a facelift or cosmetic remodelling?

In the particular case, many of these quandaries can be resolved reasonably satisfactorily with the aid of common decency, good will, and a sensible ethics committee. But in the wider world, who can decree for the directions medicine may now be taking? Now

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that (in the rich world at least) medicine has accomplished most of its basic targets as understood by Hippocrates, William Harvey, or Lord Horder, who decides its new missions?

In this situation, public alarm is bound to grow over the high-tech ‘can do, will do’ approach apparently embraced by scientific medicine at the cutting edge – medicine led by an elite that sometimes seems primarily interested in extending its technical prowess, with scant regard for ends and values, or even the individual sufferer. Where patients are seen as ‘problems’ and reduced to biopsies and lab tests, no wonder sections of the public vote with their feet, and opt for styles of holistic medicine that present themselves as more humane.

What may be more disquieting than the switch to alternative treatments is the public’s fixation on medicine. Ironically, the healthier Western society becomes, the more medicine it craves; indeed, it comes to regard maximum access to medicine as a political right and a private duty. Especially in the USA, where a free market operates, intense pressures are created – by, for example, the medical profession, medi-businesses, the media, and compliant (or susceptible) individuals – to expand the diagnosis of treatable illnesses. Scares about new diseases and conditions arise. People are bamboozled into more and more lab tests, often of dubious reliability. Thanks to ‘diagnostic creep’, ever more disorders are revealed, or, as many would say, concocted. Extensive and expensive treatments are then urged. In the USA, the physician who chooses not to treat leaves himself exposed to accusations of malpractice. Anxieties and interventions spiral upwards. Practitioners, lawyers, and pharmaceutical companies do well, even if patients don’t get well; and medicine is increasingly blown off course.

To understand the roots of the trouble, particularly in the USA but elsewhere too, we need to examine these elements in the light of historical change. The problem is endemic to a system in which an expanding medical establishment, faced with a healthier population of its own creation, is driven to medicating normal life events (such as the menopause), to converting risks into diseases, and to treating trivial complaints with fancy procedures. Doctors and ‘consumers’ alike are becoming locked within a fantasy that unites the creation of anxiety with gung-ho ‘can-do, must-do’ technological

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perfectibilism: everyone has something wrong with them, everyone can be cured. Medical success may be creating a Frankenstein's monster, what has been called by Ivan Illich, a critic of modern medicine, the 'medicalization of life'. To air these predicaments is not antimedical spleen – a churlish reprisal against medicine for its victories – but simply a realization of medical power that is growing not exactly without responsibility but with dissolving goals. Even though this may be in medicine's finest hour, it might also be the dawn of its dilemmas.

For centuries medicine was impotent and hence unproblematic. From the Greeks to the First World War, its job was simple: to struggle with lethal diseases and gross disabilities, to ensure live births, and to manage pain. It performed these uncontroversial tasks mostly with meagre success. Today, with mission accomplished, medicine's triumphs are dissolving in disorientation. The task facing medicine in the twenty-first century will be to redefine its limits even as it extends its capacities.

The triumphs and trials of modern medicine can be understood only in a historical framework. That understanding must be based on proper scholarship. All too often oversimplified and caricatured visions of the rise of medicine are reproduced in books and newspapers. For example, the late and extremely distinguished American physician, Lewis Thomas, wrote that

The history of medicine has never been a particularly attractive subject in medical education and one reason for this is that it is so unbelievably deplorable . . . bleeding, purging, cupping and the administration of infusions of every known plant, solutions of every known metal, every conceivable diet including total fasting, most of them based on the weirdest imaginings about the cause of disease, concocted out of nothing but thin air – this was the heritage of medicine until a little over a century ago.<sup>2</sup>

One understands the emotions behind Professor Thomas's statements. His view, however, amounts to extremely bad history: almost every statement contained in the quotation above will be shown, somewhere in this volume, to be untrue. If we reduce the history of medicine to a travesty, through gross oversimplification, how can we expect to achieve more than a superficial grasp of trends at work now? One of the main aims of this volume is to create the sense that



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medicine has been constantly remaking itself, demolishing old dogmas, building on the past, forging new perspectives, and redefining its goals. In one respect, of course, medicine has always been about the same thing: healing the sick. But what that has entailed – imaginatively, organizationally, scientifically, humanely – has forever been (as this volume shows) in a state of transformation.

A few further words of explanation are due. This volume does not attempt to be a universal history of medicine worldwide, and some topics – such as primary care, surgery, and psychiatry – are covered in more detail than, for example, tropical medicine, dentistry, medical jurisprudence, and complementary therapies. The book is essentially a history of the roots, rise, and present state of the major specialities of Western medicine, or, as it might be called, scientific medicine. Very little is said about the medical systems to be found in the hundreds of tribal societies the world over; nor are there chapters on Chinese medicine, Islamic medicine, the Ayurvedic medicine of India, and the many medical systems that have flourished in Asia. The omission of those traditions is not a comment on their historical importance or value. To have done such subjects justice – and to have included more detail on other subjects – would have doubled the length of the work. These topics have been sacrificed for coherence and concentration. We have chosen instead to examine in detail the historical roots of Western scientific medicine, which, to a greater or lesser degree, is now becoming the dominant system of the world. Why this is so is one of the questions we address in this volume.

As the story told here shows, we are today living through momentous times for medicine but ones also full of doubt. During the past two centuries, and especially in recent decades, medicine has grown ever more powerful and successful. Yet there is deep personal anxiety and public debate about many of the directions in which medicine may be heading. The paradox involved (better health and longer life, but greater medical anxieties) may be understood, if not resolved, by the historical perspectives that this volume offers.

*Roy Porter*

## 1. The History of Disease

Kenneth F. Kiple

**H**umans have been fighting the diseases of ‘civilization’ since they began congregating in large numbers. There is written and pictorial evidence of this from Egypt and Mesopotamia around 1000 BC, India about 750 BC, Greece of the sixth century BC, and China about 100 BC. Yet, as the Canadian physician and historian William Osler commented, ‘Civilization is but a filmy fringe on the history of man’. By this he meant that the past four or five millennia represent a tiny fraction of 1 per cent of the time since human ancestors first appeared on earth. There is, of course, no recorded history of the ailments of people before the emergence of civilizations and thus before the diseases that they spawned, but we can make informed guesses about them from skeletons and other archaeological remains.

### Before Farming

For at least 4.5 million years, human ancestors (hominids) were hunters and gatherers. They lived in scattered groups of perhaps 50 to 100 individuals. The low numbers and low densities of the populations reduced the incidence of viral and bacterial infections so that people were not troubled by contagious diseases such as small-pox or measles, whose pathogens require large and dense populations for survival. Moreover, the lifestyle of hunter-gatherers spared them other illnesses. They were restless folk, often on the move, and thus not tied to a neighbourhood long enough to pollute water sources with human wastes that transmit disease, nor to pile up