Reflections on the changing times

Geoffrey Rose

Department of
Epidemiology and
Population Sciences,
London School of Hygiene
and Tropical Medicine,
London WC1E 7HT
Geoffrey Rose, DM, professor
of epidemiology

Br Med J 1990;301:683-7

If "Dr Present" (1990) were to meet "Dr Past" (1840) what would they make of one another? Clearly Dr Past was ignorant, his treatments useless and often hurtful: with hindsight leeches do not command respect (and I am one who has used them). And in 150 years from now how will doctors regard us? Surely in much the same way, as ignorant purveyors of poisonous drugs; and the fiberoptic endoscope will look as horrible to them as does the rigid gastroscope to us. Yet if these three doctors—Past, Present, and Future—were each to record a conversation with a dying patient the play backs might not sound so very different. The science of medicine advances, its humanity does not; and nor

does the nature of our patients' problems (pain, disability, fear, and death). Yet the social and economic context in which we practise our medicine is constantly evolving: the intrusion may be resented but it cannot be evaded.

This article is a personal commentary on some of these changes, their implications, and some possible responses. Being personal it is also selective, biased, and perhaps controversial (as well as incomplete and, at times, ill informed).

The information explosion

Knowledge is infinite. The edge of the universe is only as far as we can see, and the ultimate atomic particle may be someone else's universe; so we must not expect any deceleration in the amazing growth of information.

The new computer system in my department is of only modest size, but it can hold 9 gigabytes of medical information (9×10^9 items). There is no way in which I can see, let alone grasp, all that information. I can see only what I ask for, and so its utility is limited not by the size of the database but by my supply of sensible questions. Nowadays we have much more information than can be used.

These amazingly powerful new systems bring losses as well as gains. A recent study found that the weight of infants predicts the risk of death due to cardiovascular causes in middle age.¹ This interesting observation was possible thanks to the careful manual records compiled during 1911-30 by the health visitors of east Hertfordshire, which are still available. In the future it will no longer be possible to use old records as none of the vast quantity of medical and other data recorded on today's computers will be readable in 50 years' time, perhaps not even in 10 years' time. Medical thinking these days is confined within a short conceptual timescale.

We have yet to learn how to cope with our growing hoard of facts or with the ever growing power of computers. We need to stop admiring information. In itself it is clutter, and it should be tolerated only if it has a purpose. The first and most important questions in research (and the ones most often bypassed) are: "Why does this study need to be done?" and "What is the purpose of this information?" The proceedings of scientific meetings show that medical research is of an increasingly high technical standard, but it seems increasingly to be concerned with trivial questions whose answers lead nowhere important. The acquisition of information is being treated as an end, not a means. Similarly in teaching, all curricula expand until they exceed the students' digestive powers. Less information and more thinking would make better doctors. Professor George Pickering (my father in medicine) said that he could not recall a single patient in whom the management had been altered by his knowledge of Krebs's cycle.

Papers, plans, reports, and committees

The invention of the photocopier was a serious blow to medicine. Fortunately little of what is produced is

What will doctors think of fiberoptic endoscopy in 150 years' time?

This information will be readable in 50 years' time

SCIENCE PHOTO LIBRARY

STEVE JENKINS

actually read or life would grind to a complete halt. Throughout the health services—and outside them—professional people find themselves devoting an ever diminishing proportion of their time to following their vocation, more and more being consumed by committees, subcommittees, working parties, and the preparation or debating of reports and plans. We may love our real work, but all of these extra impositions demoralise us and lead to early retirements.

Of course there is a strong case for producing more and more information and plans, for large and representative committees, and for detailed regulations to prevent mismanagement; but the price is too great. There must be some other way to manage our affairs. A visitor to Rome will be struck by finding that the Roman forum—the administrative centre of the empire—was so small. That empire was run without the aid of photocopiers, telephones, or aeroplanes, and there is no Latin word for “subcommittee.”

The busy doctor

Personally I like to be busy—but not for the whole of my working life. In the late eighteenth century the “Fleece Medical Society” in Gloucestershire had five members, all local country practitioners.² They met monthly at the pub (The Fleece). Lunch was followed by a paper from one of the members, then discussion, and then dinner—a pleasant and relaxed occasion. Minutes of some of their meetings are still extant. These minutes record the first ever recognition that long antecedent rheumatic fever is associated with valve disease, that mitral valve disease is associated with heart failure, that chest pain is associated with coronary artery disease, and that compression of the carotid artery may abort a paroxysmal tachycardia or interrupt a migrainous headache. All this was achieved by five practitioners in less than three years—an unparalleled record of cost effective productivity. The circumstances were evidently conducive to good ideas.

This could not happen nowadays. The meals could not be charged to practice expenses (regulations forbid it), the results would not be published by a respectable journal such as the *BMJ* (they were only unsubstantiated anecdotes), and most of us are too busy to think or chat (because of our administrative duties). But if we

had the will we could make the time and opportunity. We can choose our priorities.

The mechanisms of illness

Faced with a faulty machine there are two quite distinct questions: “What’s broken?” and “What caused the breakage?” Applied to disease these correspond to pathogenesis and aetiology. The study of pathogenesis did not really get started until this century, but it then made such extraordinary progress that it pushed aetiology into the shade. The mechanisms of disease are being elucidated so fast that there will soon be few conditions in which we cannot describe in detail, even down to a subcellular level, what has gone wrong.

This growth in understanding is excellent; but unfortunately it is also distorting the balance of medicine and creating some false expectations. The delusion of psychoanalysis was the belief that insight implied cure; and now our thinking about molecular biology is going the same way. The public, and many doctors with them, have come to suppose that the discovery of oncogenes must mean that a cure for cancer is just around the corner. Unfortunately, most of the common and incurable diseases remain common and incurable. Our ability to control their symptoms has grown impressively, but our power to alter their underlying natural course has not.

The future may be more productive if those who ask “What’s broken?” will also ask “What caused the breakage?” The understanding of disease, and hence also its control, will be best advanced by studying the interaction between the internal defects (mechanisms) and the external agents or modifiers (causes). At present each approach tends to be pursued as though the other did not exist.

The fall and rise of epidemiology

It is from well-arranged medico-statistical and topographical inquiries that we are ultimately to expect a vast increase to our knowledge of the remote causes of disease. . . . The value of these researches . . . can scarcely be estimated too highly.³

These were among the opening words by the editors

The Roman Forum—not a photocopier in sight

MARY EVANS PICTURE LIBRARY

in the first issue of the *Provincial Medical and Surgical Journal*, later the *British Medical Journal*, in 1840; and now, in 1990, today's editor decided that the first article of this anniversary issue should be written by an epidemiologist. In between these two accolades there lay, unfortunately, a long barren period for the subject, while the spotlights shone on dazzling advances in medical technology. It seems, however, that epidemiology is now back again. A tally of papers in a recent sample of the *BMJ* indicated that 42% were (broadly) clinical; 28% incorporated some use of epidemiological techniques; and 32% were frankly epidemiological (dealing with risks and risk factors, disease in the population, case-control studies, and the like). The most striking feature of this resurgence of epidemiology is not a sudden outcrop of professional epidemiologists (who remain rather rare and who converse mainly with other epidemiologists), but rather an adoption of the subject by clinicians and laboratory scientists. This is splendid. It takes the subject back to its origins when in 1850 Snow, Bright, Addison, and some other brilliant clinicians got together to form the London Epidemiological Society, which speedily succeeded in banishing cholera epidemics from Britain. Then, as now, this represents a recognition by doctors that it makes sense to extend their clinical interest and skills so as to master the causes and control of disease as well as its treatment.

Undiscovered causes

Ever popular terms like "idiopathic" and "essential" are actually nonsensical as all diseases must have causes. Unfortunately most of the causes (excepting infectious agents) are still unknown, as can be seen by scanning the contents of any clinical textbook: knowledge abounds of risk factors, but not of the prime movers. Even among communicable diseases we understand rather little of why one exposed person falls ill while another stays well.

Clearly much epidemiological detective work remains to be done, but the nature of the job is changing. Success will increasingly go to the specialist—that is, to the person who combines epidemiological skills and understanding with the insider's knowledge of the technology of specialist investigations, linked with biological insights into the nature of the problem. It is the vogue nowadays to say that research needs to be multidisciplinary, but it is my impression that multidisciplinary teams are less productive than multidisciplinary investigators.

Search for the causes of disease can succeed only if there is inequality of exposure. If everyone smoked 20 cigarettes daily we would have no reason to link lung cancer with smoking and it would be classified (correctly) as a genetic disorder; for if all are exposed then the occurrence of disease wholly reflects susceptibility. One reason why the causes of so many diseases remain unknown may simply be that the necessary external agents are so widespread; yet if those agents were identified they might be avoided, at least by susceptible people.

Doctors and prevention

Everyone has to admit that prevention makes sense, but the response varies widely. Many are sceptical of its possibilities or doubtful of its relevance to their own practice. Some, especially in general practice, have accepted it with enthusiasm, although their expectations are sometimes unrealistic: effective preventive activities are highly important, but the list is actually very short. Often nominal assent is given, but the skills or the will are lacking. As Tudor Hart has written:

Disease labels linked more or less automatically to prescription still dominate thought and action among all health workers at every level. . . . Prevention is still seen as an essentially administrative task . . . requiring few clinical skills, performed at the expense of demand-led response to symptomatic disease.⁴

The new general practitioner contract and the dreaded white paper require doctors somehow to find a lot more time for paperwork, which must mean less time (and mental energy) for the rest of their work, including the practice of prevention. Let us hope that this will be merely a blip in a strong long term trend.

Doctors will welcome a preventive role only if they feel that it uses their professional skills. Those whose training omitted both nutrition and communication skills will not do well at dietary counselling, and so they will not enjoy it. Training techniques for communication skills exist and are now being used in some medical schools; there is even a rumour that within a few years they may feature in the examination. Meanwhile many doctors will want either to opt out or to hand counselling activities over to their nurse.

Taking decisions

In my young days patients expected doctors to give orders, which they did. This entailed making not only scientific judgments ("Smoking is bad for your lungs") but also judgments on values (implied in "You must give it up"). Only recently have we begun to acknowledge this distinction, and then only under pressure from our more articulate and less submissive patients, who demand a right to share in decisions where they are the arbiters of values and they—not us—must live with the outcomes. If patients share in the decisions then the decisions will often be different because their values and ours are often different. Doctors regard health, and especially survival, as paramount and they tend to favour vigorous investigation and action. For patients health is only one among a number of values and is often not the highest. The patient led pressure for a fuller and more informed share in decisions is not widely welcomed.

Screening for breast cancer is a topical issue, and medical experts have decided that a national programme is the right policy. How should a decision of this kind be reached? The box shows the balance sheet for some of the main items that need to be considered (based on the large Swedish trial⁵); but the decision is a matter of opinion.

Balance sheet for a national programme of screening for breast cancer in Sweden⁵

Benefits

One extra survivor
1760 Women reassured

Losses

Cost of screening 1850 women:

To services
To patients
75 False positive results

In 15 of the women who were found to have breast cancer the outcome was unchanged

We have (I hope) moved away from the old view that a treatment is justified merely because a benefit has been shown, and it is now necessary to measure the adverse effects and the costs. The balance sheet presents technical information, but all variables are measured in different units; and this means that no

1840s

- 1846: Public use of ether to induce anaesthesia
- 1846: American Medical Association is organised
- 1846: Ignaz Semmelweis establishes the contagiousness of puerperal fever and its prophylaxis by washing with a chloride of lime solution
- 1848: Claude Bernard discovers the glycogenic function of the liver

decision is possible until weights (values) have been assigned to each. In this example how is the distress caused by a false positive report and a biopsy to be weighed against extra duration of life?

The same issues arise in all choices on policy and priorities. The decisions, as in the example above, are made by expert groups who usually do not have access to the recipients' opinions and values. Health economists have sought to remedy this by inventing a measure called "Quality adjusted life years" (QALYs), which is based on values, of supposed universal applicability, assigned by a panel of healthy people. The difficulty is that in relation to a particular issue such as breast cancer screening these may not have been the right people to ask. It encourages widespread modern fallacies—that information can make our decisions for us and that formulas can replace thought. Policy depends on judgments as well as information, and those judgments rest on values and opinions. The crucial values are those of the recipients, not those of the policy makers or service providers; so somehow we must find ways whereby health experts and the public can share in the policy decisions, just as doctors and patients must learn how to share in clinical decisions.

Council housing in Bradford, 1985

Doctors and health

It might be easier to get proper funding of the NHS if it were easier to show a relation between health service activities and the nation's health. Such correlations are depressingly hard to show. Recent underfunding has not led to deterioration of measured health outcomes, and infant mortality and life expectancy continue their slow long term improvements. The splendid decline in the incidence of stroke long preceded the advent of good antihypertensive treatment; and the much publicised American decline in mortality from coronary disease has not been matched in Sweden, which also has excellent cardiac services. Shining exceptions stand out, like survival of patients with Hodgkin's disease or childhood leukaemia; but mortality from most diseases continues obstinately to reflect incidence, and the rise and fall of major public health problems reflect the rise and fall of their causes. Those causes lie in the realm of social, economic, and environmental affairs.

In the age of scientific optimism it was believed that medicine had, or was soon to discover, the answers to our health problems: if the president of the United States gave enough millions of dollars cancer would be conquered. That optimism has passed (except in the popular media) and we are starting to sober up. Medicine has indeed delivered effective answers to some health problems and it has found means to lessen the symptoms of many others, but by and large we remain with the necessity of doing something about the incidence of disease. And that means a new approach to partnership between doctors and all those whose decisions influence the determinants of incidence.

The public's choices

If doctors are not primarily responsible for the nation's health then the nation is. The public, through its government, decides how much of its resources should go to the NHS. We have now realised (though only recently) that this can never be enough, and hence the miserable situation of having to decide between priorities. Dylan Thomas wrote of his father's blindness:

"Do not go gentle into that good night
Rage, rage against the dying of the light"

We, too, should rage more than we do. We may indeed be forced to decide that there is not enough money for a woman of 65 to have a liver transplantation and the extension of life that this offers; but the fact that we must make such decisions should be accompanied by loud protest. It is society, not the medical services, that enforces these cruel options, and society (and its government) should not be allowed to turn a blind eye to what it is doing (particularly as many of these hard choices are necessary only because of such vast expenditure on armaments).

I have been profoundly impressed by observing the almost perfect correlations, when comparing different populations, between the average consumption of alcohol and the prevalence of heavy drinking, or between average blood pressure and the number of hypertensive patients, and so on. Both public and medical concern about health matters (and social problems) concentrates on the minority of people with special problems. The size of these sick groups, however, simply reflects society's characteristics and behaviour; that is to say, the public as a whole must accept responsibility for its sick deviants. The level of consumption by moderate drinkers determines the number of alcoholics, and so on. This has such revolutionary implications that we cannot be at all hopeful of its acceptance.

In research in the civil service my colleagues and I found that mortality among workers of the lowest skill grades was more than three times greater than that among the top brass. This illustrates Britain's scandalous social class inequalities in health (as in many other of life's good things). In absolute terms the health gap between rich and poor is smaller than in the last century, but relatively it seems to be widening. Here lies perhaps the greatest of today's public health challenges. Its causes are economic and social, and

so its remedies must also be economic and social. Medicine, health, and politics cannot be kept apart, and they should not be kept apart.

- 1 Barker DJP, Osmond C, Winter PD, Margetts B, Simmonds SJ. Weight in infancy and death from ischaemic heart disease. *Lancet* 1989;iii:577-80.
- 2 Proudfit WL. The Fleece Medical Society. *Br Heart J* 1981;46:589-94.
- 3 Green, Streeten. Introductory address. *Provincial Med Surg J* 1840;1:1.
- 4 Hart JT. Prevention of coronary heart disease in primary care: seven lessons from three decades. *Family Practice* (in press).
- 5 Tabar L, Gad A, Holmberg LH, *et al*. Reduction in mortality from breast cancer after mass screening with mammography. *Lancet* 1985;i:829-32.

***Sickness and Health* (1843)**

Thomas Webster (1800-86; British)

After winning the gold medal of the Royal Academy in 1824 Thomas Webster began his career as a portrait painter. But success came with "Rebels Shooting a Prisoner"—a painting showing boys firing a toy cannon at a girl's doll. Finding the genre popular, from then on he specialised in pictures of children at play. In 1856 he moved to Cranbrook, Kent, where he was a founder member of the Cranbrook Colony, a group of artists who modelled themselves on seventeenth century Dutch genre painters. Unfortunately its cloying qualities mean that

"Sickness and Health" is not Webster at his best, though its theme, childhood illness, was popular given the prevailing high childhood mortality. Happily, Webster's invalid seems to be recovering.

CLASSIC OF THE DECADE

1842: Edwin Chadwick's *Report on the Sanitary Condition of the Labouring Population of Great Britain*. London: W Clowes and Sons.