

Medicine as a profession

Hip, Hip, Hippocrates: extracts from *The Hippocratic Doctor*

John Fabre

What do doctors know of Hippocrates? Many have seen a presumed likeness of “the father of medicine”—a sharp eyed, balding Greek in a toga, often under a tree. Some may remember taking the Hippocratic Oath, which contains the laudable injunction to “first do no harm.” (In fact, it doesn’t, just as nobody says: “Play it again, Sam” in “Casablanca.”) Those who have checked the oath recently will know that it takes an unfashionable stance on abortion, euthanasia, and women in medicine.

For a man who influenced 2500 years of medical practice the historical record is very hazy. Historians have now decided that the great body of writings that bears his name is better known as the Hippocratic Corpus, having being written over at least 70 years by many different hands, none of them definitely Hippocrates’. Unsurprisingly, these multiauthor volumes have their internal inconsistencies, abrupt changes of style and tone, and incompatible world views.

But much sounds very modern, and this forms the basis of John Fabre’s new book, “*The Hippocratic Doctor: Ancient Lessons for the Modern World*”. In writing it, Fabre found it necessary to scour virtually the entire corpus to put together Hippocratic thinking on a particular issue. He has grouped extracts from 50 treatises under eight main themes. What follows are selections from Fabre’s book used to illustrate four of these themes.—Tony Delamothe, BMJ

The Hippocratic doctor

On Fractures (chapter I)—“In fact the treatment of a fractured arm is not difficult, and is almost any practitioner’s job, but I have to write a good deal about it because I know practitioners who have got credit for wisdom by putting arms in positions which ought rather to have given them a name for ignorance. And many other parts of this art are judged thus: for they praise what seems outlandish before they know whether it is good, rather than the customary which they already know to be good; the bizarre rather than the obvious.”¹

On Joints (chapter LXXVII)—“What you should put first in all the practice of our art is how to make the patient well; and if he can be made well in many ways, one should choose the least troublesome. This is more honourable and more in accord with the art for anyone who is not covetous of the false coin of popular advertisement.”¹

Physician (chapter I)—“The dignity of a physician requires that he should look healthy, and as plump as nature intended him to be; for the common crowd consider those who are not of this excellent bodily condition to be unable to take care of others. Then he must be clean in person, well dressed, and anointed with sweet-smelling unguents that are beyond suspicion. For all these things are pleasing to people who are ill, and he must pay attention to this. In matters of the mind, let him be prudent, not only with regard to silence, but also in having a great regularity of life, since this is very important in respect of reputation; he must be a gentleman in character, and being this he must be grave and kind to all. For an over-forward obtrusiveness is despised, even though it may be very useful ... In appearance, let him be of a serious but not harsh countenance; for harshness is taken to mean arrogance and unkindness, while a man of controlled laughter and excessive gaiety is considered vulgar, and vulgarity especially must be avoided.”²

Precepts (chapter IV)—“Should you begin by discussing fees, you will suggest to the patient either that you will go away and leave him if no agreement be reached, or that you will neglect him and not prescribe any immediate treatment. So one must not be anxious about fixing a fee. For I consider such a worry to be harmful to a troubled patient, particularly if the disease be acute. For the quickness of the disease, offering no opportunity for turning back, spurs on the good

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physician not to seek his profit but rather to lay hold on reputation. Therefore it is better to reproach a patient who have saved than to extort money from those who are at death's door.³³

Precepts (chapter VI)—"I urge you not to be too unkind, but to consider carefully your patient's superabundance or means. Sometimes give your services for nothing, calling to mind a previous benefaction or present satisfaction. And if there be an opportunity of serving one who is a stranger in financial straits, give full assistance to all such. For where there is love of man, there is also love of the art."³³

Precepts (chapter VIII)—"A physician does not violate etiquette even if, being in difficulties on occasion over a patient and in the dark through inexperience, he should urge the calling in of others, in order to learn by consultation the truth about the case, and in order that there may be fellow-workers to afford abundant help."³⁴

Laws (chapter I)—"Medicine is the most distinguished of all the arts, but through the ignorance of those who practise it, and of those who casually judge such practitioners, it is now of all the arts by far the least esteemed. The chief reason for this error seems to me to be this: medicine is the only art which our states have made subject to no penalty save that of dishonour, and dishonour does not wound those who are compacted of it. Such men in fact are very like the supernumeraries in tragedies. Just as these have the appearance, dress and mask of an actor without being actors, so too with physicians; many are physicians by repute, very few are such in reality."³⁴

Ancient Medicine (chapter IX)—"For most physicians seem to me to be in the same case as bad pilots; the mistakes of the latter are unnoticed so long as they are steering in a calm, but when a great storm overtakes them with a violent gale, all men realise clearly then that it is their ignorance and blundering which have lost the ship. So also when bad physicians, who comprise the great majority, treat men who are suffering from no serious complaint, so that the greatest of blunders would not affect them seriously—such illnesses occur very often, being far more common than serious disease—they are not shown up in their true colours to laymen if their errors are confined to such cases; but when they meet with a severe, violent and dangerous illness, then it is that their errors and want of skill are manifest to all. The punishment of the impostor, whether sailor or doctor, is not postponed, but follows speedily."³³

The Hippocratic tradition of rational medicine

Precepts (chapter I)—"Healing is a matter of time, but it is sometimes also a matter of opportunity. However, knowing this, one must attend in medical practice not primarily to plausible theories, but to experience combined with reason."³³

Precepts (chapter II)—"... conclusions which are merely verbal cannot bear fruit, only those do which are based on demonstrated fact. For affirmation and talk are deceptive and treacherous. Wherefore one must hold fast to facts in generalisations also, and occupy oneself with facts persistently, if one is to

acquire that ready and infallible habit which we call 'the art of medicine.'³³

Hippocratic approaches to therapy

Epidemics VI (section 5, chapter I)—"The body's nature is the physician in disease. Nature finds the way for herself, not from thought... Well trained, readily and without instruction, nature does what is needed."³⁵

Regimen in Acute Diseases (chapter VII)—"And it seems to me worthwhile to write on such matters as are not yet ascertained by physicians, though knowledge thereof is important, and on them depend great benefit or great harm. For instance, it has not been ascertained why in acute diseases some physicians think that the correct treatment is to give unstrained barley-gruel throughout the illness; while others consider it to be of first-rate importance for the patient to swallow no particle of barley, holding that to do so is very harmful, but strain the juice through a cloth before they give it."³⁴

Dreams, haemorrhoids, and other miscellaneous points

Regimen IV (chapter LXXXVI)—"He who has learnt aright about the signs that come in sleep will find that they have an important influence upon all things. For when the body is awake the soul is its servant, and is never her own mistress, but divides her attention among many things, assigning a part of it to each faculty of the body—to hearing, to sight, to touch, to walking, and to acts of the whole body; but the mind never enjoys independence. But when the body is at rest, the soul, being set in motion and awake, administers her own household, and of herself performs all the acts of the body. For the body when asleep has no perception; but the soul when awake has cognizance of all things—sees what is visible, hears what is audible, walks, touches, feels pain, ponders. In a word, all the functions of body and of soul are performed by the soul during sleep. Whoever, therefore, knows how to interpret these acts aright knows a great part of wisdom."³⁶

The Sacred Disease (chapter XVII)—"Men ought to know that from the brain, and from the brain only, arise our pleasures, joys, laughter and jests, as well as our sorrows, pains, griefs and tears. Through it, in particular, we think, see, hear, and distinguish the ugly from the beautiful, the bad from the good, the pleasant from the unpleasant."³⁴

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Swearing to care: the resurgence in medical oaths

Brian Hurwitz, Ruth Richardson

We are witnessing a resurgence of professional interest in medical oaths and codes of conduct. In the United Kingdom the General Medical Council has reissued its professional code and, together with the BMA, the royal colleges, and other organisations, has published a document on the “core values” of medical practice.^{1 2} There has been discussion of the role of oath taking at the end of medical training, and the BMA has drafted a new Hippocratic Oath on behalf of the World Medical Association (see third box).^{3–11} The American Medical Association has this year commemorated the 150th anniversary of its 1847 Code of Ethics with an extensive debate on the relevance of oaths and codes to modern practice.^{12–14}

In many Western countries the process of refashioning health care to contain costs is precipitating rapid flux in the social relationships of medical practice. Doctors are no longer in a simple clinical relationship with patients: the structure of health services now involves them in many other tasks, some of which may entail conflicting responsibilities. Funding organisations and managers increasingly influence the nature and extent of the care which can be provided. At the same time, health care has become multidisciplinary in nature and multiagency in delivery. Scientific advances and new technological capabilities throw up difficult and sometimes bizarre moral predicaments. All these changes make for greater moral complexity in everyday practice.

The medical profession is being forced to face hard choices in patient care and to re-examine its own role in health care, causing it to look again at the nature of its own values. The Hippocratic Oath is being re-examined afresh for moral guidance. Traditionally a solemn promise invoking supernatural authority as witness, the oath entails making a covenant with other members of the profession to share knowledge freely, to respect one's teachers, and to behave towards patients according to the Hippocratic Code (box). There follows the conditional curse invoked upon transgressors, which includes censure by and exclusion from the profession and from human happiness.

The changing oath

Problems and controversies surround the textual authenticity and meaning of the original oath. It is not clear if or how much Hippocrates himself contributed to it, or how much it influenced health care in ancient Greece. It is probable that only a minority of doctors swore the oath. Some of its prohibitions seem to fly in the face of what is known about clinical practice in ancient Greece, which included surgery, abortion, and tolerance of infanticide.^{3 16 17}

Those who have administered the oath during succeeding centuries have taken it on themselves to omit, add to, and change its clauses. For example, Elizabethan renditions required doctors to provide gratuitous care to the poor and not to flee from but to

Summary points

Oath taking commits doctors to observe an ethical code

New obligations thrust on doctors may conflict with their first responsibility to care for patients

Complex and sometimes bizarre moral predicaments emerge from scientific advances and new technological capabilities

Modern health care is provided by multidisciplinary teams in multiagency environments

A pan-professional oath could allow all health carers to share a commitment to core values

See editorial by Berwick et al

Department of Primary Care, Imperial College School of Medicine, St Mary's Campus, London W2 1PG

Brian Hurwitz, senior lecturer

Wellcome Research Fellow in the History of Medicine, Department of Anatomy, University College London, London WC1E 6BT

Ruth Richardson, historian

Correspondence to: Dr Hurwitz b.hurwitz@ic.ac.uk

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treat victims of plague.³ Present day versions tend to be agnostic on these matters.

A recent exegesis describes the oath as “a solemn promise: (a) of solidarity with teachers and other physicians; (b) of beneficence and non-maleficence towards patients; (c) not to assist suicide or abortion; (d) to leave surgery to surgeons; (e) not to harm, especially not to seduce patients; (f) to maintain confidentiality and never to gossip.”¹⁸ Tensions between the impetus of the original oath and the modern endeavour to ensure good practice according to bioethical principles are apparent in this text. Values *a* and *d*, which seek to foster an archaic professional exclusivity, sit uncomfortably with *b*, *e*, and *f*, which modern doctors would regard as fundamental principles: beneficence, non-maleficence, and confidentiality. Such incongruities point up the difficulties of applying the original oath to present day medical care. Many institutions bypass the

Hippocratic Code

“I will follow that system of regimen which, according to my ability and judgement, I consider for the benefit of my patients, and abstain from whatever is deleterious and mischievous. I will give no deadly medicine to anyone if asked, nor suggest any such counsel; and in like manner I will not give to a woman a pessary to produce abortion. With purity and with holiness I will pass my life and practise my Art. I will not cut persons labouring under the stone, but will leave this to be done by men who are practitioners of this work. Into whatever houses I enter, I will go into them for the benefit of the sick, and will abstain from every voluntary act of mischief and corruption; and further, from the seduction of females or males, of freemen and slaves. Whatever, in connection with my professional practice or not in connection with it, I see or hear, in the life of men, which ought not to be spoken of abroad, I will not divulge, as reckoning that all such should be kept secret.”¹⁵

problem altogether by administering oaths which are entirely modern in content, but which are titled Hippocratic.¹⁹

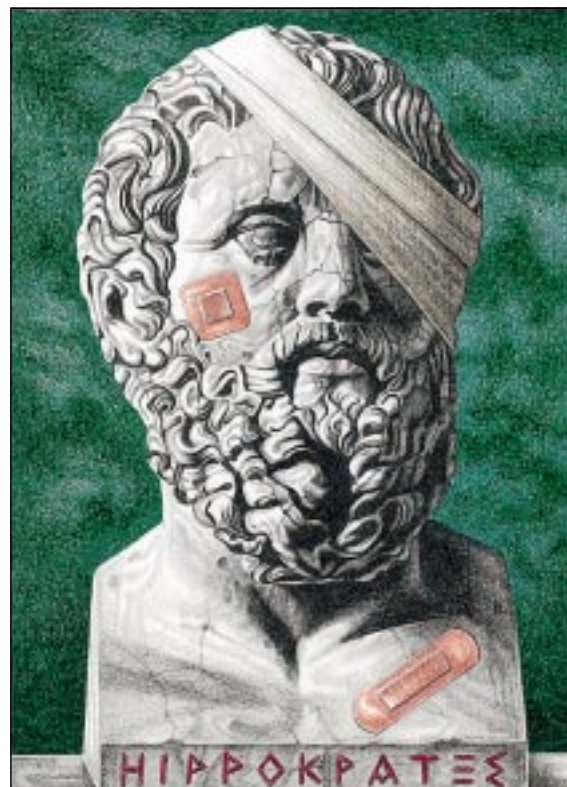
Who takes the oath?

Surveys show that about half of the medical schools in the United Kingdom and almost all of those in the United States administer an oath of some kind, mostly at graduation but occasionally earlier, a few at the outset of medical studies. Some use a modernised version of the Hippocratic Oath or of the Prayer of Maimonides, others use the Declaration of Geneva (box), and others still, their own institutional oath. The process of oath taking differs: some schools ask for graduands' affirmation by signature, in others the oath is read out or students recite it together during the graduation ceremony.^{6 9 19} The question of how voluntary such oath taking is has not been well documented. We have heard of no students who have opted out, or what would happen if they so chose.

Oaths and ethics

To the extent that oaths indicate a commitment to firm moral parameters, their affirmation may strengthen doctors' resolve to behave with integrity in extreme circumstances. This was the finding of a BMA working party investigating medical involvement in and resistance to human rights abuses. This group recommended that "medical schools incorporate medical ethics into the core curriculum, and that all medical graduates make a commitment, by means of affirmation, to observe an ethical code."²¹

In the United Kingdom the GMC's code *Duties of a Doctor* has evolved over time in response to alleged breaches of its guidance, changes in the organisation of health care, new law, and changing mores in society.²² Since it has a statutory basis and carries great



professional authority, what could swearing an oath add to it?

We have not located any studies which examine whether oath taking affects doctors' competence to deliberate effectively on ethical matters. The main intention of a medical oath seems to be to declare the core values of the profession and to engender and strengthen the necessary resolve in doctors to exemplify professional integrity, including traditional moral virtues such as compassion and honesty. Oaths also provide moral orientation through rule-like precepts and prohibitions, from which generalities the practitioner is left to infer or extrapolate to the specifics of everyday practice. Medical codes on the other hand seek to clarify the means by which such moral ends can be achieved, by offering guidance for everyday practice, outlining applicability in exemplary cases together with grounds for identifying exceptions. Affirmation of an ethical code by means of an oath therefore permits the oath to contain within its remit a supplementary field of guidance.

Others at the bedside

All the medical oaths and codes we have considered are traditionally viewed as relating only to doctors, although there is a suggestion that the Hippocratic Oath was originally designed to be taken by doctors' assistants and associates.²³ But many of the moral difficulties in present day health care arise in the context of complex organisations in which other members of the healthcare team are bound by different codes of conduct (or by none at all), perhaps with conflicting responsibilities and obligations. Some of these people have the power to influence clinical decisions since they represent and are answerable to powerful third parties (government, insurance companies, NHS trusts, health maintenance organisations) which have

Declaration of Geneva

"At the time of being admitted as a Member of my Profession:
I solemnly pledge myself to consecrate my life to the service of humanity;
I will give to my teachers the respect and gratitude which is their due;
I will practice my profession with conscience and dignity;
The health of those in my care will be my first consideration;
I will respect the secrets that are confided in me, even after the patient has died;
I will maintain by all the means in my power, the honour and the noble traditions of my profession;
My colleagues will be my sisters and brothers;
I will not permit considerations of age, disease or disability, creed, ethnic origin, gender, nationality, political affiliation, race, sexual orientation, or social standing to intervene between my duty and my patient;
I will maintain the utmost respect for human life from its beginning, even under threat, and I will not use my specialist knowledge contrary to the laws of humanity;
I make these promises solemnly, freely, and upon my honour."²⁰

Draft revision of the Hippocratic Oath

"The practice of medicine is a privilege which carries important responsibilities. All doctors should observe the core values of the profession which centre on the duty to help sick people and to avoid harm. I promise that my medical knowledge will be used to benefit people's health. They are my first concern. I will listen to them and provide the best care I can. I will be honest, respectful and compassionate towards patients. In emergencies, I will do my best to help anyone in medical need.

"I will make every effort to ensure that the rights of all patients are respected, including vulnerable groups who lack means of making their needs known, be it through immaturity, mental incapacity, imprisonment or detention or other circumstance.

"My professional judgment will be exercised as independently as possible and not be influenced by political pressures nor by factors such as the social standing of the patient. I will not put personal profit or advancement above my duty to patients.

"I recognise the special value of human life but I also know that the prolongation of human life is not the only aim of health care. Where abortion is permitted, I agree that it should take place only within an ethical and legal framework. I will not provide treatments which are pointless or harmful or which an informed and competent patient refuses.

"I will ensure patients receive the information and support they want to make decisions about disease prevention and improvement of their health. I will answer as truthfully as I can and respect patients' decisions unless that puts others at risk of harm. If I cannot agree with their requests, I will explain why.

"If my patients have limited mental awareness, I will still encourage them to participate in decisions as much as they feel able and willing to do so.

"I will do my best to maintain confidentiality about all patients. If there are overriding reasons which prevent my keeping a patient's confidentiality I will explain them.

"I will recognise the limits of my knowledge and seek advice from colleagues when necessary. I will acknowledge my mistakes. I will do my best to keep myself and colleagues informed of new developments and ensure that poor standards or bad practices are exposed to those who can improve them.

"I will show respect for all those with whom I work and be ready to share my knowledge by teaching others what I know.

"I will use my training and professional standing to improve the community in which I work. I will treat patients equitably and support a fair and humane distribution of health resources. I will try to influence positively authorities whose policies harm public health. I will oppose policies which breach internationally accepted standards of human rights. I will strive to change laws which are contrary to patients' interests or to my professional ethics."¹¹

determinative influence on the care doctors can provide.

More than one medical commentator has used parody to predict the impotence of any new Hippocratic oath in these circumstances:

"Whatsoever I shall see or hear of the lives of men that is not fitting to be spoken, I shall document fully in their charts so that complete, problem-oriented records may be available for any insurers, legal counsellors, or government agencies that may become involved ... I will exercise my art *not* solely for the cure

of my patients but will take into account the return-on-investment, the cost-benefit ratio ... since, in the overall picture society will benefit, even though an individual patient may suffer some hardship or relapse."²⁴

A pan-professional oath?

Such problems are clearly not for doctors alone to resolve. The American Academy of Arts and Sciences has recently instigated a transatlantic initiative to create a shared ethical code for health carers (see editorial in this issue by Berwick et al). It outlines a number of serious dilemmas which require the concerted attention of all healthcare professions and which would benefit from open public debate. Is it ethical to exclude specific treatments from healthcare coverage or service packages? Is it ethical to keep information secret which might benefit all patients everywhere but which provides an organisation with a competitive advantage? Can it be ethical to care selectively for less sick patients instead of more sick ones because of political or financial imperatives?

If a pan-professional oath were to be established it could engender a positive degree of moral cohesion between all caring professions, across institutional boundaries, influencing perhaps even the organisation of health care. This is the lesson to be drawn from the American Medical Association's recent attack on the ethical impropriety of so called gag clauses, which seek to place contractual constraints on doctors' freedom of speech. After the association's intervention, several health plans in the United States immediately removed such clauses, and more than 100 submitted their contracts to the association for ethical review.²⁵

The hope is that a single oath for all health care professions could heal split loyalties and ameliorate existing moral tensions in health care. The intention is honourable, and no one should underestimate the difficulty of the task. A comparison of existing codes for non-doctors and the recent BMA draft revision of the Hippocratic Oath (box) might serve as a good starting point for exploring common ground. It bodes well, we think, that, like the doctors' oath, the conduct codes of nurses and managers place patients' welfare paramount.^{26 27} The challenge, then, may not be one of agreeing ends, but means. Agreeing on such an oath would provide an inclusive opportunity for healthcare workers from different walks of life to speak with one voice for the benefit of patients.

We thank the BMA's ethics department for help in locating information for this paper.

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Professionalism must be taught

Sylvia R Cruess, Richard L Cruess

Centre for Medical Education, McGill University, 1110 Pine Avenue West, Montreal, Quebec, Canada H3A 1A3
Sylvia R Cruess, associate professor of medicine
Richard L Cruess, professor of surgery

Correspondence to: Dr Sylvia R Cruess

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The subject of professionalism is often referred to in the medical literature, but the word itself is rarely defined—and it is assumed that physicians understand what it means to be a professional and use this understanding as they make decisions in their private and professional lives. Though this may have been true in the past, the lack of literature dealing with professionalism available to the average doctor is striking. When this is coupled with the absence of relevant material in the curriculum of most medical schools, it is understandable why, in a rapidly changing world, doctors may not have a clear understanding of what the public expects from its professionals.

The General Medical Council's approach to professionalism and self regulation is a response to the rapidly changing relation of all professions to society and is designed to allow medicine to meet new societal demands and expectations. Dealing with problems having to do with doctors' performance and attitudes, Irvine presented the subject in the overall context of professionalism in the modern world.^{1,2} He emphasised the importance of independence (which some call "autonomy") and stated that it depended on the three pillars of expertise, ethics, and service. He then linked the concept of an independent profession, as granted by the state, to self regulation. As have almost all observers of the present scene,³ Irvine emphasised the importance of trust to the relationship between patient and doctor and the profession and society. In outlining the structures within which self regulation takes place, he emphasised the "leadership role of leaders in influencing the behaviour of future physicians." In doing so, he noted that an admirable role model was important.

We would like to extend this concept. Elsewhere we have said that leaders are required to do more than simply provide excellent role models.⁴ Most doctors do not fully understand the obligations they must fulfil to satisfy public expectations and maintain professional status. We believe that doctors will meet their obligations if they understand their origins and their nature. Thus, professionalism must be taught.

The healer and the professional

Doctors simultaneously fill two overlapping but none the less distinct roles: the healer and the professional.

Summary points

Professional status is not an inherent right, but is granted by society

Its maintenance depends on the public's belief that professionals are trustworthy

To remain trustworthy, professionals must meet the obligations expected by society

The substance of professionalism should be taught at all levels of medical education as part of the profession's response to changing societal expectations

From early times there have been healers in society. In Western culture the traditions go back to Hippocrates, and for centuries the Hippocratic oath served as the foundation of the morality of medicine.⁵ The professions, on the other hand, arose in guilds and universities during the middle ages,⁶ but they remained ill defined and touched only a small percentage of the population until the industrial revolution made it possible for the public to pay for services—and science made medicine effective enough to be worth purchasing. These two important roles are recognised in the literature, but they are rarely separated for analysis. This is unfortunate, as many doctors feel that fulfilling the role of healer is sufficient and do not willingly accept professional obligations. For example, the healer is under no obligation to sit on audit committees or to engage in other administrative activities, but the professional must.

The relationship of the professional and the healer is not complicated. Society requires the healer, but there must be an organisational framework within which the services of the healer are dispensed. In the Anglo-American world, professional status is used as a method of organising the delivery of complex services.⁶ This status is granted by the state and defined by laws outlining licensing and in the charters and regulations of the various certifying bodies. It can be modified or withdrawn if society is not satisfied with the

performance of its professionals, and there is ample evidence that the status of all professions has changed over the past three decades.⁷

The definition and characteristics of a profession

If doctors are to understand the source of their obligations they must understand professionalism. The *Oxford English Dictionary* states that a profession is “the occupation which one professes to be skilled in and to follow. (a) a vocation in which a professed knowledge of some department of learning or science is used in its application to the affairs of others, or in the practice of an art founded upon it. (b) in a wider sense: any calling or occupation by which a person habitually earns his living.”⁸

The word “professes” is important, because in this way a professional becomes dedicated to service. It requires the command of a body of knowledge or skills, and it also specifically refers to “art,” something that is clearly important in medicine. The definition, however, does not adequately describe the complexity of modern professions. These characteristics of professions (box), which have changed with time, are drawn from the literature; most observers will agree that they are correct. These characteristics are not listed in order of importance. At the heart of every profession is a legally sanctioned control over a specialised body of knowledge, and a commitment to service.⁹ As the average citizen cannot fully comprehend the body of knowledge, the Anglo-American world has granted the professions the right to self regulation. Autonomy is given on the understanding that professionals will put the welfare of both the patient and society above their own, and that they will be governed by a code of ethics. Those who write about professionalism are united in believing that professions must be “moral” or devoted to the public good. In addition, professionalism as a concept is believed to be an ideal to be pursued.¹⁰ It is understood that physicians are human, and that they will not always achieve the ideal, but in striving for it they should reach ever higher levels of performance.

The evolution of professionalism

Changes in the medical profession and in public expectations have been documented extensively in books and journals not generally read by doctors—those in the fields of the social sciences and bioethics. This literature offers perceptive, often critical, but generally telling, insights into the interface between professions and society. Early work was largely favourable to the concept of professionalism, and it was felt that the service orientation of the professional would benefit society.^{11–13} In the mid 1960s and 1970s the tone changed, and professionalism as a concept was viewed as being flawed, partly because of the inherent conflict between altruism and self interest. The medical profession was criticised for its emphasis on remuneration, its failure to self regulate adequately, its apparent inability to address problems felt to be important by society, and the fact that the profession often puts its own welfare above that of both society and individual patients.^{14–19} Without question, this literature reflected public

opinion and had an influence on the public perception of the medical profession.

During the past 15 or so years the literature has been more supportive of professions,^{10 20–22} but the medical profession should not become complacent, as public trust in doctors and their associations has not improved greatly. Throughout the Anglo-American world, however, the medical profession is no longer viewed as being principally responsible for the direction of health care. This responsibility is shared with the state and the corporate sector, and they are now sharing blame for defects in the system. Thus there is an opportunity for the profession to address the issues facing it in an atmosphere that is less hostile. Individual doctors evidently retain the trust and respect of their patients, and patients continue to wish that major decisions concerning their health are made by doctors rather than corporations or the state. The public is the ally of the medical profession in this area.²³

The educational challenge

Doctors are judged both as healers and as professionals, and when they do not fulfil their obligations in either role both they and the profession suffer. When the medical profession was smaller, more homogene-

Characteristics of professions

- A profession possesses a discrete body of knowledge and skills over which its members have exclusive control
- The work based on this knowledge is controlled and organised by associations that are independent of both the state and capital
- The mandate of these associations is formalised by a variety of written documents, which include laws covering licensure and regulations granting authority
- Professional associations serve as the ultimate authorities on the personal, social, economic, cultural, and political affairs relating to their domains. They are expected to influence public policy and inform the public within their areas of expertise
- Admission to professions requires a long period of education and training, and the professions are responsible for determining the qualifications and (usually) the numbers of those to be educated for practice, the substance of their training, and the requirements for its completion
- Within the constraints of the law, the professions control admission to practice and the terms, conditions, and goals of the practice itself
- The professions are responsible for the ethical and technical criteria by which their members are evaluated, and they have the exclusive right and duty to discipline unprofessional conduct
- Individual members remain autonomous in their workplaces within the limits of rules and standards laid down by their associations and the legal structures within which they work
- It is expected that professionals will gain their livelihood by providing service to the public in the area of their expertise
- Members are expected to value performance above reward, and are held to higher standards of behaviour than are non-professionals.



ous, and had more truly shared values—and when the issues were simpler—professional values could be imparted during the process of “socialisation” of doctors in training. The profession is now diverse, as in almost every country doctors come from various cultural, ethnic, and economic backgrounds. Though this represents an advance in terms of equity and fairness, it makes the transmission of common values more difficult and, in our opinion, requires explicit teaching of the role of both the healer and of the professional. As Irvine noted, the leader in medicine retains a critical role,¹ but this leader must teach professionalism in a structured way in addition to demonstrating professional values in everyday life.

Medical schools, teaching hospitals, and those responsible for continuing medical education should teach professionalism as a subject formally identified in the curriculum. The material to be taught will change in different cultures and certainly with time. The teaching of professionalism should include several components.

- (1) Identifiable educational content in the undergraduate medical school curriculum devoted to professionalism, which should be reinforced in postgraduate programmes and in continuing medical education. The subject should be part of the evaluation of all students.
- (2) The concept that to be a professional is not a right but a privilege with a long history and tradition of healing and service.
- (3) The separate but linked concepts of the physician as healer, and the physician as professional, and the fact that society uses professional status as a means of organising the delivery of services.
- (4) A clear definition of professionalism and its characteristics.

(5) Professionalism as an ideal to be pursued, emphasising its inherent moral value. The concept of altruism and “calling” must be highlighted as essential to professionalism.

(6) An understanding that proper professional behaviour is essential for the healer to function fully and to maintain the trust of patients and society.

(7) Knowledge of codes of ethics governing the conduct of both the healer and the professional, as well as the philosophical and historical derivations of these codes.

(8) The essential nature of the autonomy of the individual doctor, along with the legitimate limitations that have always existed. The degree of autonomy will vary in different societies, but a minimum is required for a doctor to exercise the necessary independent judgment to best serve the patient.

(9) The nature of the collective autonomy of the profession, along with its legitimate and inherent limitations.

(10) Relevant material drawn from sociology, philosophy, economics, political science, and medical ethics as related to professionalism, including interpretations of both the historical course of events and of doctors’ behaviour that are critical of the medical profession. The profession must not be allowed to build and maintain its own myths while avoiding ideas challenging them.

(11) The link between professional status and the obligations to society that must be fulfilled to maintain public trust. These obligations should be explicitly outlined and included in the teaching. They include obligations to know and be guided by the applicable codes of ethics and national and regional laws; to participate in more effective and transparent self regulation; to address health issues of concern to society; to maintain competence throughout one’s medical career; to be prepared to be fully accountable for all decisions taken; to expand and ensure the integrity of medicine’s knowledge base by supporting science in its broadest sense; to insist on the maintenance of sufficient individual and professional autonomy to enable the doctor to act in the best interests of the patient; and to be governed by professional standards of conduct no matter what role is being filled—private practitioner, employee of the state or corporation, manager, administrator, or a mixture of roles. Finally, of course, the obligation to put the welfare of the patient and of society above one’s own is paramount.

Conclusion

A recent editorial entitled “Do professions have a future?” outlined the challenges facing the medical profession and suggested some responses.²⁴ However, the question was not answered directly. For two reasons, professions not only have a future—and it is in the best interests of society that professional status be maintained. In the first place, self regulation in the profession should lead doctors to be better motivated than they would be if they considered themselves to be employees of the state or of a corporation. Secondly, if professionalism is an ideal to be pursued it should lead to ever higher standards which, by being constantly aimed at, lead to higher levels of performance.

Most doctors wish to meet their obligations properly. To quote Kultgen, “Entry into the profession is a voluntary act, and most people who perform it are

disposed to learn its ways and take its ideology seriously. They need only to be told how.”¹⁰ Properly informing them is one of the tasks of Irvine’s medical leaders.

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Medicine needs its MI5

Duncan Campbell

The time is long overdue to add another arm to the policing of medicine. In this article I suggest changes to lever out of the profession the small minority of doctors who would be guilty of serious misconduct, to the benefit of patients and practitioners alike. On the evidence, most of them might currently reasonably expect to escape either exposure or sanction, for various reasons. We need an organisation that would employ informants and agents, run anonymous telephone “tipoff lines,” hire undercover investigators, and use for example, secret recording devices and cameras. Readers who feel that this sort of life should be limited to west Belfast in the 1980s have an understandable case. Such an investigatory recipe might have been even more indigestible six months ago, before Professor David Southall revealed that he had secretly installed hidden cameras in the paediatric wards of the Royal Brompton and North Staffordshire Hospitals. His results—38/39 cases of suspected infant child abuse resulting in care orders and 33/39 in criminal prosecution—both speak for themselves and explain why there was no press backlash to suggest that Southall and his team had breached sacrosanct clinical principles. Read what follows with that in mind.

Why complaints currently fail

My proposals are based on personal experience of bringing unethical practitioners before the General Medical Council (GMC) and of acting against unqualified “quacks” at the disreputable end of alternative medicine. All of the four complaints that I have taken to the council have resulted in the practitioner concerned leaving the medical register for life—three practitioners by order of the council’s professional conduct committee, one voluntarily. The record of Dr Frank Wells and Peter Jay, who run Medicolegal Investigations (a private medical investigations company), is far more impressive. By last July 17/17

Summary points

Too few complaints about doctors’ unethical behaviour get past the General Medical Council’s preliminary procedures

Most doctors who behave unethically are escaping exposure or sanction

Special methods and powers are needed to support valid complaints about doctors

A new agency is needed to police the medical profession, so that medical misconduct can be properly investigated and punished

complaints brought to the council by Wells and Jay had resulted in the practitioners being struck off. More are in the pipeline.

This 100% success rate with the GMC stands in stark contrast to the average picture at the council, where less than 10% of complaints of serious professional misconduct are taken beyond the preliminary screeners, and at best half of those go on for adjudication. Why is this so?

Many complaints to the GMC should fail because they are vicarious, malicious, or outside the GMC’s remit. But many worrying complaints are rejected because complainants have a poor understanding of the evaluative processes inside the GMC. These processes are much more legal than medical, and medically qualified complainants do not necessarily fare better than the lay public, since good medical evidence is not necessarily good legal evidence. The professional conduct committee quite properly acts like a court of law, according to broadly the same rules

IPTV,
45 Frederick St,
Edinburgh
EH2 1EP
Duncan Campbell,
*investigative
journalist*
duncan@gm.apc.org

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and requiring facts and documents to be proved in an adversarial setting. The GMC's committees and employees have to approach their tasks with this outcome in mind.

To succeed with the GMC, complainants ideally should have professional or acquired medicolegal skills. They should set out the facts to be relied on in a way that shows the screeners that legal proof is available or that there is an easy and probably successful route to proof. The facts alleged should amount, if proved, to serious professional misconduct. Knowledge of typical, recent, and relevant adjudications by the professional conduct committee is a major asset. This is a lot to expect of a recently damaged patient or a worried doctor concerned about the ethics of colleagues' behaviour.

Medicine needs a better complaints investigation system

It is unreasonable and damaging to the interests of medicine to allow this lottery to continue. Very few cases where clinical or research misconduct is suspected command experienced support and investigation at the precomplaint stage. Thus many important cases fall by the wayside because they do not get the resources to make them convincing at first sight.

The media serve the public interest but are not in being for this reason. Medicolegal Investigations is a commercial organisation, working mostly for pharmaceutical companies who suspect research fraud in their trials. They operate in the marketplace. Most media investigations, including my own, have focused on clinical misconduct. But the media are also in the marketplace. The media are primarily an entertainment industry, which by accident rather than design produces quality journalism that is in the public interest. The industry is rightly seen as a court of last resort for whistleblowers and the distressed, but what it can deliver is increasingly limited by whim, fashion, "dumbing down," and the budget managers who today populate our industry as much as yours.

I and my media colleagues have done many investigations of unethical practitioners inside and outside the profession, which, when published, have prompted patients and doctors alike to point us to other cases that unquestionably need attention. But when an editor decides that two medical misconduct stories in a given year fulfil the public's interest, our hands are tied. So do not expect to rely on us. The public interest, and the best interests of patients, therefore needs institutions rather than one investigative firm and a few journalists.

Investigative techniques for proof of misconduct

Investigative methods, including special techniques, are necessary if proof of misconduct is to be reliably established. The ways to do this come easily enough to policemen and journalists, but not to doctors and lawyers. Secret cameras are probably the most extreme example of such methods. I have taken (or arranged for others to take) hidden recorders into consultations where we posed as terminally or chronically ill patients,

or their friends, to obtain incontrovertible evidence of misconduct.

Without this, we would have nothing of value to show the screener. Complaints would have to rely on patients whose personal recollection of what was said and done in a consultation is limited by the absence of notes and the lack of a record. In contrast, the misbehaving doctor may take notes throughout. Ill and worried patients are likely give poorer evidence than doctors, who may have already acquired court experience. Above all, patients will often not complain until long after the events at the heart of their concerns and will always be vulnerable to destructive cross examination. In cases of terminal or chronic illness, patients may be too debilitated to give evidence or dead by the time the complaint reaches the professional conduct committee. Patients who are badly treated may therefore need the services of sham patients to prove the type of misconduct that they experience.

Worried doctors who witness or suspect professional misconduct are not in a much better position than their patients. Medical whistleblowers still have no safe home, even though the position is gradually improving. Juniors and seniors alike fear reprisals and career curtailment if they speak out, and are right to do so. Consider the case of Dr Stephen Bolsin, the anaesthetist who was the first to highlight the unacceptable mortality in heart surgery operations on babies in Bristol. He was told by hospital managers that his complaint put him, not the surgeons, in jeopardy. He too represents the tip of a large iceberg.



MARK OLDROYD

To this may be added the cultural factors, especially for older doctors and those in more close knit institutions, where self interest and laziness easily go hand in hand. Rare too is the whistleblower who does not arrive at the GMC without some personal pathology on show. Complainants are often "difficult" people. It goes with the turf, because otherwise they would long since have given in and gone under. They often have a long history of taking their well founded complaints to bodies that shoo them away. They may already have been ostracised, marginalised, excluded, and become obsessive. The rejection of earlier complaints can complicate and obfuscate evaluation of their primary complaints, as it will be enlarged by legitimate but irrelevant objections to the outcome of other, prior investigations.

Complainants also face the special risk that they cannot expect their role to stay private. The GMC maintains a high standard of confidentiality in the early stages of its work; but if a formal inquiry is launched and a professional conduct committee hearing is held, the successful complainant will inevitably be exposed in the later, wholly public processes. Vulnerable medical complainants may therefore need the services of an investigative agency, which will seek to obtain independent and valid evidence to support their complaint, thus limiting or excluding the possibility of retribution at the hands of powerful members of the profession.

When competently recorded evidence is available, the miscreant practitioner cannot challenge what he or she did in the clinical setting. The results are effective (box). But some may think these investigative methods repugnant. I have lectured about such investigations to medical students and have worried that this may frighten them into switching to safer worlds, such as accountancy. But they need not fear. The broadcast media do not and are not permitted to use techniques such as covert recording unless the following legal "minimisation" criteria are met: firstly, there must be a strong prima facie case that there is misconduct; secondly, other investigative methods must have failed or would by their nature be likely to fail if tried; and thirdly, that the methods proposed are likely to succeed in producing legally valid evidence of misconduct. Decisions on these matters must, by statute, be taken by controllers of broadcasting stations, not by individual journalists. With the incorporation into British law of the European Convention on Human Rights, these boundaries will be even more clearly defined.

Tip of more than one iceberg

Cases of misconduct in research fraud that are taken to the GMC represent only the tip of the iceberg,¹ a view that Wells endorses. This was a major reason for the recent founding of the committee on publication ethics.² In dealing with discredited research work and despite the plethora of serious recent cases like Pearce and Anderton, the profession is delivering far less than the public is entitled to demand. When some of a practitioner's research is shown to have been dishonest, it should be elementary to conclude that every part of his or her work is dishonest until the contrary is proved. But the editors of biomedical journals who believe this

Four doctors who left the medical register

John Anderton, a consultant physician and former secretary of the Royal College of Physicians (Edinburgh), was struck off in July 1997 for conducting a sham drug trial. His misconduct was exposed after an investigation by Medicolegal Investigations, which had been commissioned by Pfizer after a company clinical trials monitor suspected misconduct.

Geoffrey Fairhurst, a Merseyside general practitioner and former member of a local research ethics committee, was struck off in 1996 after an investigation by Medicolegal Investigations confirmed that he had falsified data and consent for patients supposedly taking part in research trials. His case led to calls from the GMC for colleagues to blow the whistle when they came across fraud and misconduct.

Peter Nixon, a consultant cardiologist, consistently diagnosed the hyperventilation syndrome in thousands of patients with a wide range of conditions. I and others presented to him, using recorders and secret cameras, to show how he rigged clinical findings. After he lost a libel case he was ordered to cease practising medicine. He left the register voluntarily in October 1997.

James Sharp, a former NHS consultant haematologist who set up a clinic in Harley Street, London, to sell unproved immunological treatments for AIDS, cancer, and leukaemia. He was exposed after BBC's *Watchdog* programme recorded an interview with a sham AIDS patient, to whom he prescribed a £10 000 course of treatment without consulting records or conducting an examination. He was struck off in December 1989.

and act accordingly are still distinguished only by their scarcity.

In my experience, cases of serious clinical misconduct that the media have investigated also represent only the tip of an iceberg. This is especially true in private medical practice: those whom I have investigated had taken their "research" directly into clinical practice, often with tragic consequences.

Shortcomings of General Medical Council

The view of self regulation (by the GMC) as "institutionalised conspiracy," which MP Jim Cousins described to parliament in 1995 during the first reading of the Medical (Professional Performance) Bill, may be unattractive to the profession. But he knew what he was talking about; his research was based on constituents' experiences. Whether just or not, the reality is that the GMC's review panels are perceived in responsible quarters as lacking independence. Many members of the council might agree that its remit and resources are too restricted, even though these have been expanded over the past decade.

Everywhere in medical regulation there is inconsistency and muddle. The United Kingdom Central Committee for Nursing and Health Visiting can investigate any sort of misconduct; the GMC cannot. For doctors, the GMC disavows setting professional standards, while the royal colleges will set standards but disavows policing them. The NHS has a range of remedies on offer—notably, for example, the ombudsman. But there is a vast hinterland of fast moving junior

doctors, wandering locums of indeterminate skill, and circuses of private practitioners, who can evade all of the regulators.

Notoriously, the GMC is not proactive. It waits for cases to come to it. This means that complaints are limited not only by the problems created by its procedures, but by the willingness of prospective complainants to expend time and effort in, and face the risks of, becoming involved. We are all the losers from that.

New investigative agency needed

What is needed is a proper investigative agency to receive and research complaints, and take them up when action may be appropriate. It is more than two years since Professor Ian Kennedy called for an inspectorate to conduct random, routine audits of medical conduct. Let it begin there but extend the idea to cover the problems outlined above.

I suggest an "office for medical standards," which would conduct routine and random medical auditing; provide a safe place where worried staff (or students) could go with their concerns; be an investigative agency that can take plausible complaints of patients (and others) and check, in ways that the complainant cannot, whether a problem may or does exist; review records and publications when fraud or misconduct is suspected. It should also:

- Run a confidential helpline or information service, or both, to receive warnings and tipoffs about fraud or unethical conduct;
- Have the legal power (to be sanctioned at a senior level) to call in or inspect documents and papers held by health service providers (both NHS and private) and by registered medical practitioners;
- Use appropriate investigative methods when these can be justified; and
- Have a remit to conduct reviews of research or clinical practice to report generally on standards.

Such an agency could protect complainants who were vulnerable to reprisals provided that its investigative methods (and results) produced adequate evidence, which either duplicated or could replace the original complaint. After investigation, reports need not necessarily go to the GMC; they could go to the ombudsman or to other NHS bodies.

These proposals do not amount to replacing the GMC or the ombudsman. They would supplement and probably replace the work of the GMC's screeners and incorporate the limited investigative work already undertaken in the NHS by the ombudsman. The decision whether to strike a doctor off would remain with the professional conduct committee. But an office for medical standards would prosecute—in place of the current arrangements.

The GMC might ask that the proposed office should come under its auspices. Such a request should be rejected. The office should be an independent watchdog, carrying out a policing function, whereas the GMC would retain its court and registration function. Thus the new agency could not be accused of being judge and jury in the cases it handles. Self regulation would survive, albeit in a modified form.

The peril of these proposals, some may think, is that Britain might become a more litigious nation—as some states of America notoriously are. I reply that most of the serious professional misconduct is still uninvestigated and unpunished. If changes result in more cases being heard by the professional conduct committee and more doctors being struck off, that is what has always been needed.

Some may also be concerned about the effects of such an agency on the young and the innocent in medicine. I have never believed that the innocent have nothing to fear from surveillance—it has a chilling effect and will in some cases deter proper risk taking and experimentation.

Regulation would be part of the answer. Investigators, like doctors (and broadcast journalists and police officers), would be bound by codes of conduct too. Inevitably, some disreputable doctors would be insufficiently deterred, while reputable practitioners might be made unduly cautious. Balance is the other part of the answer.

Medical regulation currently has a few constables and detectives with limited remits, supplemented by a motley array of amateur assistants. It needs a police force, perhaps even a medical MI5.

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The *BMJ* and the 77 specialties of medicine

Richard Smith

The editor explains how the *BMJ* and different medical specialties can help each other

BMJ, London
WC1H 9JR
Richard Smith,
editor

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"The *BMJ* never publishes anything useful to leechologists. You haven't got a single leechologist on your editorial board. Once in a blue moon you publish a leechology paper, and it's always bloody awful. I don't know who you get to review them. What you don't seem to understand is that leechology is one of the most important specialties in medicine. There aren't enough

of us, we're overworked, and general practitioners don't seem to know even the basics. Everyday we're dealing with dreadful cock ups. It's time your journal taught ordinary doctors the rudiments of leechology."

Sadly, I hear this message regularly from representatives of the 77 different medical specialties. Some of the failures are inevitable. The *BMJ* is not intended



Important and not so important politicians read the *BMJ*. Readers are warned that two of these pictures are fakes.

to teach plastic surgery to plastic surgeons: if it did, we would lose contact with the 99.5% of our readers who are not plastic surgeons while we did so. Rather the *BMJ* attempts to concentrate on what matters to all doctors. Interestingly, medical educators are discovering that the knowledge and skills needed by doctors in different specialties are more similar than dissimilar.

When I meet with disgruntled specialists—as I do often—we usually have an enjoyable meeting and discover that there are many ways in which we can help each other. As it might take me a long time to work through 77 specialties in 122 countries, I thought I should write down answers to some of the questions that come up commonly.

How can we get our messages across?

This is usually the main question that specialists ask me, and I might tell them to employ a public relations specialist. Increasingly, medical specialties do, but they are expensive and I can give you the basics for free.

(1) Be clear about what your messages are

If your primary interest is to promote your specialty rather than put across a message that has health importance, then life will be difficult. The *BMJ* is very interested in clinical messages that are important to a broad audience. We are much less interested in the trials and tribulations of the specialty because every specialty has them and feels misunderstood. We could fill the journal with pieces like the following:

“Every year 250 000 people in Britain die of leech related diseases. Yet these patients must be cared for by only 127 fully qualified leechologists. General practitioners do not understand leechology, and it is hardly mentioned in undergraduate education. Recruitment to the specialty is a problem. The Medical Research Council has no leechologist on its committees and spends less than 1% of its budget on leech related diseases. The NHS Executive has failed to recognise the workload of the specialty. And the World Health Organisation has closed down its leechology unit in Turkestan.”

(2) Decide on the main audience for your messages

If the messages are intended for all doctors, medical students, politicians, and senior health managers then the *BMJ* is the right place. If the message is intended prima-

rily for a particular group of specialists there may be other places where publication is easier to achieve.

(3) Prepare a long term strategy for your messages

Specialists sometimes imagine that their problems will be solved by a Lesson of the Week (or “cock up of the week,” as we call it) describing three examples of the mistake they see most commonly. They won't. Education is a never ending process that needs messages to be delivered in different forms, in different media, time and time again.

If, for example, general practitioners are your main target then, as well as trying to get something into the *BMJ*, you should try medical magazines such as *Pulse*, *General Practitioner*, and *Doctor*. *BMJ* space is under enormous pressure, whereas some of the medical newspapers have trouble at times keeping the advertisements apart. They can also publish large colour pictures, and if your message is dramatic enough they will probably send a journalist to write it for you. And some of these newspapers reach more general practitioners than the *BMJ* because they are sent free to all of them, whereas the *BMJ* in the United Kingdom is sent only to members of the BMA. You might also consider approaching the doctors who organise vocational training and postgraduate courses for general practitioners.

The key thing is to plan long term and get your message repeated through many different media.

Why don't you accept our papers?

It's tough to get a paper published in the *BMJ*. We reject 85% of papers, and so if you are an average researcher you will get only one out of seven published. Simple statistics mean that you have a high chance of having 10 in a row rejected. There is thus lots of room for becoming paranoid and imagining that we have it in for you or your specialty. We don't.

We want papers that are scientifically sound and relevant to a broad audience. We don't want papers that describe a great idea but include no proper evaluation. Good ideas are easy. Evaluation is hard.

Where can we get published in the *BMJ*?

Anywhere, but think hard about the best form. If your message is educational, then a paper is probably not the best form. Many more people read editorials and

educational articles than read original papers. If it is about improving the whole management of oral cancer then it will need to be at least a Fortnightly review, perhaps even an ABC. If it is a concentrated message on the need for tibial fractures to be managed by a multidisciplinary team then an editorial might be best. But you'll need evidence, not just assertion, and the editorial should not read as though it has been written by a committee of people so important that none of them ever sees a patient. If it is just a feeling, try a Personal View. Something very short and sweet might be a Minerva paragraph—a great way to get through to a lot of doctors.

You need to fit your message to the forms available in the *BMJ*. We are reluctant to invent new forms, although we might. Readers need to know what to expect. You could send us something that's completed, or you could write suggesting a topic for an editorial, telling us why it is important and suggesting who might write it. We are particularly interested in authors from outside Britain.

Will you consider uncommissioned editorials?

Yes. We peer review them. Keep them short and snappy and make them evidence based.

How can we get a letter published?

By writing a clear, un pompous, evidence based letter of not more than 400 words that says something interesting. Don't just whinge. Be positive.

How can we teach ordinary doctors the basics?

By concentrating on what ordinary doctors really need to know about your specialty and not getting carried away. An ABC can be a good route—but they are easy to read and so tough to write. Of every 10 people who offer us an ABC, only one delivers.

Why don't you cover our meetings?

We can't possibly get to all meetings, and meeting reports can be desperately dull: "The chairman,

Professor Sir Windbag, reminded everybody of the importance of the subject. Professor West said that. Professor East said this. The lunch was excellent. Everybody agreed it had been an excellent meeting and looked forward to next year."

If the meeting is really exciting we will send somebody. Alternatively, you could send us the list of those attending and we might identify somebody to write for us. Or we might be interested to take a version of one of the keynote speeches.

How can we get into News?

Do or say something newsworthy.

If we have an important report, will you cover it?

Probably, but we would like a copy before publication so that we can write about it as it appears. And we don't want you writing about your report. That's too much like people reviewing their own books. We will find somebody, but we welcome suggestions.

How can we get through to politicians?

With difficulty, but the *BMJ* is one good route. Politicians read the *BMJ*.

How can we help you?

I thought you'd never ask. This is the way to peoples' hearts. We need you. Without input by doctors of all shapes and sizes the *BMJ* is nothing. Keep sending us material and forgive us our occasional incivilities and inefficiencies.

Will it all end in tears?

Sometimes but not usually. The more general and the more hard pressed the publication—whether it's the *New York Times* or *Nature*—the more likely you are to have something rejected and feel misunderstood. But please come back.

How to do it

How to acquire a coat of arms

John Thurston

Faculty of Accident and Emergency Medicine, London WC2A 3PN
John Thurston, registrar

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The Faculty of Accident and Emergency Medicine was inaugurated on 2 November 1993. The new council decided that it would like a logo or badge to signify its identity and to adorn such items as headed notepaper and the president's badge of office. As registrar I was instructed to approach the College of Arms for letters-patent granting the faculty its own coat of arms.

Because of the multidisciplinary nature of accident and emergency medicine, the faculty is an intercollegiate one based on six royal colleges. The faculty has flourished, it has a steadily increasing membership, and the faculty board's examination committee holds regular examinations for fellowship of the faculty twice a year.

Achievement of arms

The first step was to approach the College of Arms in London and the duty herald, who in our case was William Hunt, Portcullis Pursuivant of Arms. He led me through the detailed process of acquiring our armorial bearings.

We submitted the articles of constitution of the faculty to Portcullis, who submitted them to the Kings of Arms. The faculty was then given permission to petition the Earl Marshal for armorial bearings. Portcullis had made it clear that the smaller the committee designing the coat of arms the better. He

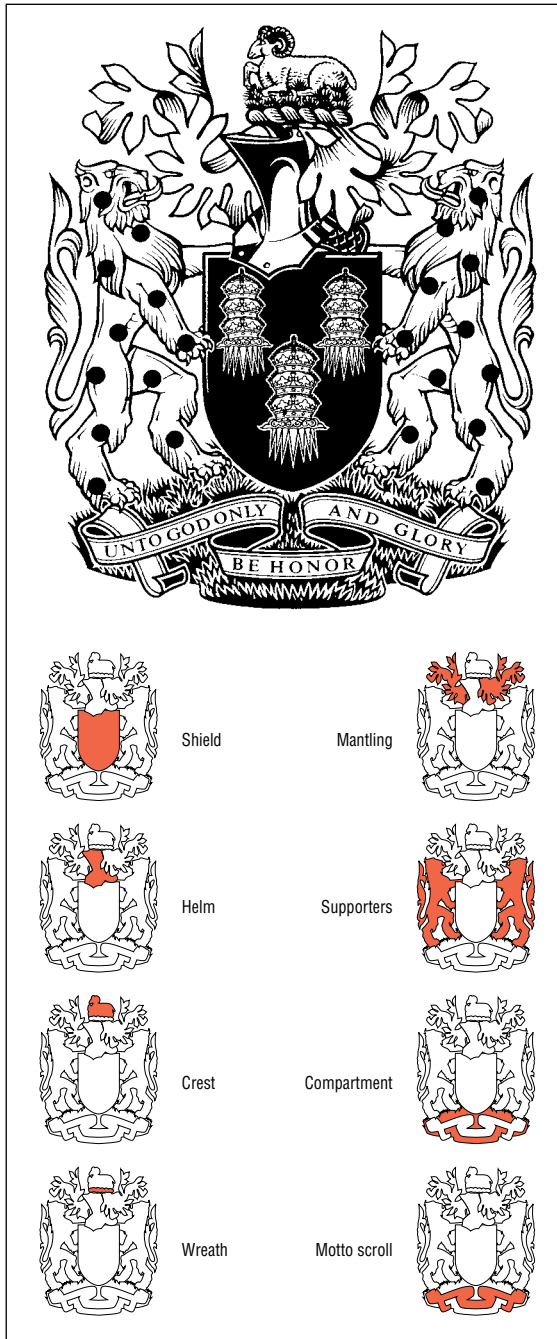


Fig 1 Principal elements of coat of arms of Worshipful Company of Drapers

favoured a committee of one. In the event we formed a small subcommittee of three.

Figure 1 shows the principal elements of an achievement of arms, in this case those of the Worshipful Company of Drapers.

Eight items form the main elements of a full coat of arms.

Shield—The shield is the essential element of the coat of arms and with the banner is the principal means of heraldic display. Shields are of many different shapes, largely reflecting the century in which they were created.

Helm and crest—The helm is the heraldic term for a helmet and the crest sits on top of the helm. For centuries it has been considered a privilege to bear a

crest, an honour over and above the right to bear arms.

Wreath—The wreath is a band of twisted material that was draped around the mediaeval helmet as decoration and to cover the base of the crest where it was fixed to the helm.

Supporters—The supporters are figures, either beasts or humans, placed on either side of the shield to support it. These supporters are referred to as they are in medical terms—that is, the one on the left as you look at the coat of arms is described as being on the right—and the heraldic term dexter is used while sinister is used for the left hand supporter.

Compartment—In a coat of arms the supporters stand on a base called a compartment. This is usually a grassy mound.

Motto—The motto is a short pithy summary, which may be written in any language, summarising the aspirations of the holder of the armorial bearings.

Heraldic badge

When arms and crests are granted it is possible for a badge to be included as well. Badges were used by retainers in the Middle Ages to show their allegiance. A good example of this is the Wars of the Roses, in which the Yorkist followers wore white roses and the Lancastrians wore red. Many organisations have badges in addition to the arms and crest. They use the full coat of arms on their seal and stationery while the badge is used for more general purposes such as adorning the ties of members.



Fig 2 Coat of arms of Faculty of Accident and Emergency Medicine



Fig 3 Badge of the faculty

Design

This is the hardest part of preparing the application for letters-patent. It was easy to see why Portcullis favoured a committee of one. In the event we were able to produce a satisfactory design, but only after several false starts.

Figure 2 shows the final design of our coat of arms. The crest consists of a waxing and waning moon on either side of a symbolic sun. This depicts the fact that accident and emergency work goes on by night and day. The shield is a conventional shape and is divided into two by a symbolic lightning strike indicating the use of electricity in accident and emergency, both for

instrumentation and defibrillation. The two halves of the shield are symbolically coloured as night (purpure or purple) and day (argent or silver).

On the sinister half, in the argent part of the shield is a poppy proper (proper indicates that it is painted in its natural form), representing the use of opiate analgesia. The dexter supporter is the wound man. This rather dramatic drawing shows the numerous types of wound to which man may be subjected. We thought that it was striking and unusual and made our coat of arms just that bit different from others. The supporter on the sinister side represents a healthy man. The compartment has on the dexter side nettles and on the sinister side dock leaves, indicating harm and the folklore cure for the harm caused by nettles.

Finally, we created a motto, which means "We always help the sick." We chose Latin because we thought that it would have the gravitas that an English motto would not.

Badge

Figure 3 shows the final design for the badge. Six poppies interspersed with seedheads depicted proper, represent the six parent colleges from which the intercollegiate faculty was formed, and continue the theme of pain relief as depicted on the sinister half of the shield.

The bee, again depicted proper and volant (flying), requires explanation. The bee was chosen for three reasons. Firstly, the bee is a busy energetic insect and represents industry. Secondly, the bee works best in a team and this is how a good accident and emergency department functions. Thirdly, the bee is the symbol of the City of Manchester, where the first chair of accident and emergency medicine was created.

Letters-patent

The whole process cost about £6000. This is a reduced price because the faculty is a registered charity. Commercial bodies pay nearly £9000, whereas individuals pay a fee of £2575 for arms and a crest.

At the banquet after the faculty's annual general meeting on 24 January 1997 Portcullis presented the letters-patent (fig 4) to our first president, Dr David Williams. The final product has the three seals of the Kings of Arms (Garter, Clarenceux, and Norroy and Ulster). The letters-patent are beautifully written in heraldic terms and the coat of arms and badge are painted by the artist (Stephen Sandon) in full colour.

These letters-patent are presented for all time and if the faculty eventually becomes the Royal College of Accident and Emergency Medicine it will fly its coat of arms on a flag above the building. The letters-patent remain the property of the organisation even if it changes from faculty to college.

I am indebted to William Hunt, Portcullis Pursuivant of Arms, for his guidance; to Stephen Friar and John Ferguson, whose book *Basic Heraldry* inspired this paper; and my colleagues on the design committee, Mr Jonathan Marrow and Dr Evan Bayton.



Fig 4 Letters-patent of the faculty

*A difficult case***Diagnosis made by hallucinatory voices**

Ikechukwu Obialo Azuonye

A previously healthy woman began to hear hallucinatory voices telling her to have a brain scan for a tumour. The prediction was true; she was operated on and had an uneventful recovery.

No previous illnesses

Born in continental Europe in the mid-1940s the patient settled in Britain in the late 1960s. After a series of jobs, she got married, started a family, and settled down to a full time commitment as a housewife and mother. She rarely went to her general practitioner as she enjoyed good health and had never had any hospital treatment. Her children had also been in good health.

In the winter of 1984, as she was at home reading, she heard a distinct voice inside her head. The voice told her, "Please don't be afraid. I know it must be shocking for you to hear me speaking to you like this, but this is the easiest way I could think of. My friend and I used to work at the Children's Hospital, Great Ormond Street, and we would like to help you."

AB had heard of the Children's Hospital, but did not know where it was and had never visited it. Her children were well, so she had no reason to worry about them. This made it all the more frightening for her, and the voice intervened again: "To help you see that we are sincere, we would like you to check out the following"—and the voice gave her three separate pieces of information, which she did not possess at the time. She checked them out, and they were true, but this did not help because she had already come to the conclusion that she had "gone mad." In a state of panic, AB went to see her doctor, who referred her urgently to me.

I saw her at the psychiatric outpatients clinic, and diagnosed a functional hallucinatory psychosis. I offered general supportive counselling as well as medication with thioridazine. To her great relief, the voices inside her head disappeared after a couple of weeks of treatment, and she went off on holiday. While she was abroad, and still taking the thioridazine, the voices returned. They told her that they wanted her to return to England immediately as there was something wrong with her for which she should have immediate treatment. By this time, she was also having other beliefs of a delusional nature.

She returned to London and I saw her again at my outpatients clinic. By this time, the voices had given her an address to go to. Reluctantly, and just to reassure her that it was all in her mind, her husband took her by car to the address in question; it was the computerised tomography department of a large London hospital. As she arrived there, the voices told her to go in and ask to have a brain scan for two reasons—she had a tumour in her brain and her brain stem was inflamed. Because the voices had told her things in the past that had turned out to be true, AB believed them when they

said that she had a tumour and was in a state of great distress when I saw her the next day.

Brain scan requested

In order to reassure her, I requested a brain scan, explaining in my letter that hallucinatory voices had told her that she had a brain tumour, that I had not, personally, found any physical signs suggestive of an intracranial space occupying lesion, and that the purpose of the scan was essentially to reassure the patient. The request was initially declined, on the grounds that there was no clinical justification for such an expensive investigation. It was also implied that I had gone a little overboard, believing what my patient's hallucinatory voices were telling her.

Eventually, after some negotiation, the scan was done in April. The initial findings led to a repeat scan, with enhancement, in May, revealing a left posterior frontal parafalcine mass, which extended through the falx to the right side. It had all the appearances of a meningioma.

The consultant neurosurgeon to whom I referred AB noted the absence of headache or any other focal neurological deficits related to this mass, and discussed, with AB and her husband, the pros and cons of immediate operation as against waiting for symptoms to appear. In the end, it was agreed to proceed with an immediate operation. AB's voices told her that they were fully in agreement with that decision.

These were the notes of the operation, carried out in May 1984: "A large left frontal bone flap extending across the midline was turned following a bifrontal skin flap incision. Meningioma about 2.5" by 1.5" in size arose from the falx and extended through to the right side. A small area of tumour appeared on the medial surface of the brain. The tumour was dissected out and removed completely along with its origins in the falx."

AB later told me that when she recovered consciousness after the operation the voices told her, "We are pleased to have helped you. Goodbye." There were no postoperative complications. The dosage of dexamethasone was halved every four days, and then it was stopped. She was on prophylactic anticonvulsants for six months. Antipsychotic medication was discontinued immediately after the operation, and there was no return of the hallucinatory voices or the delusions which she had expressed.

Discussion

AB telephoned me last Christmas to wish me and family a merry festive season, and to tell me that she had been completely well in the 12 years since the operation. It was this telephone call that brought this case to mind again.

It is well known that intracranial lesions can be associated with psychiatric symptomatology. But this is

Adult Mental Health Unit, Lambeth Healthcare NHS Trust, London, SW9 9NT

Ikechukwu Obialo Azuonye, consultant psychiatrist

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the first and only instance I have come across in which hallucinatory voices sought to reassure the patient of their genuine interest in her welfare, offered her a specific diagnosis (there were no clinical signs that would have alerted anyone to the tumour), directed her to the type of hospital best equipped to deal with her problem, expressed pleasure that she had at last received the treatment they desired for her, bid her farewell, and thereafter disappeared.

I presented her case at a conference later that year. AB attended and was closely questioned by several people about the various aspects of her experience. The audience was split down the middle. People who would be called X-philes today rejoiced that what had happened to her was a clear instance of telepathic communication from two well meaning people who had, psychically, found that AB had a tumour and sought to help her.

The X-phobes had a very different formulation. According to them, AB had been given the diagnosis of a brain tumour in her original country and wanted to be treated free under the NHS. Hence, they surmised, she had made up the convoluted tale about voices telling her this and that. But AB had lived in Britain for 15 years and was entitled to NHS treatment. Besides, she

had been so relieved when the voices first disappeared on thioridazine that she had gone on holiday to celebrate the recovery of her sanity.

There was a group at the case conference who offered a different opinion. Their view was that, the total lack of physical signs notwithstanding, it was unlikely that a tumour of that size had had absolutely no effect on the patient. "She must have felt something," they argued. They suggested that a funny feeling in her head had led her to fear that she had a brain tumour. That fear had led to her experience of hallucinatory voices. She may have unconsciously taken in more information about various hospitals than she realised, and this information was reproduced by her mind as part of the auditory hallucinatory experience. The voices expressing satisfaction with the outcome of her treatment were her own mind expressing its relief that the emergency was over. And the total disappearance of psychiatric symptoms after the removal of the tumour showed that these symptoms were at least directly related to the presence of the lesion—and may, in fact, have been produced by the lesion itself. I have obtained the patient's signed consent to publication.

History

Two hundred years since Malthus

John A Black

Victoria Mill House,
Framlingham,
Woodbridge,
Suffolk IP13 9EG
John A Black,
retired consultant
paediatrician

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Malthus was by training a mathematician and by profession a teacher of political economy, but his work was greatly influenced by his Christian convictions. In the first edition of his *Essay*, published in 1798, he put forward the hypothesis that population, if unchecked, would increase by geometrical ratio, doubling itself every 25 years, while food supply could increase by only arithmetical ratio. He suggested that population was controlled by "positive checks" such as war, famine, and disease.

He campaigned unsuccessfully for the gradual abolition of the old poor laws which, he thought, encouraged the working class to marry young and to have large families. In his second edition he introduced the concept of the "preventive checks" by moral restraint—late marriage and restraint within marriage. The reduction in fertility which Malthus advocated was achieved by the acceptance of birth control, to which he was violently opposed. He was attacked during his lifetime and has been misinterpreted and misunderstood ever since.

Academic career

Thomas Robert Malthus (known as Robert) (fig 1) was born on 14 February 1766 near Dorking, Surrey. He was born with a cleft lip and palate, but this does not seem to have hindered his academic career. In 1785 he entered Jesus College, Cambridge, where he read mathematics, obtaining a first class degree. He was

elected fellow of the college in 1797, and four years later took Holy Orders. In 1805 he was appointed professor of history and political economy at the newly founded College of the East India Company, at Haileybury, in Hertfordshire (now Haileybury and Imperial Service College). He held this post until his death in 1834 from "disease of the heart" in Bath (fig 2). He married at the age of 38 and had three children.

Positive checks to population

Reacting against his father's enthusiasm for the Utopian ideas of the Marquis de Condorcet and William Godwin, Malthus published the first edition of his "essay" as a long pamphlet in 1798 (fig 3). Its full title was "An essay on the principle of population as it affects the future improvement of society. With remarks on the speculations of Mr. Goodwin, M. Condorcet, and other writers."¹

He set out his views clearly: "The power of population is infinitely greater than the power in the earth to produce subsistence for man. Population when unchecked, increases in a geometrical ratio. Subsistence increases only in arithmetical ratio ... By that law of our nature which makes food necessary to the life of man, the effects of these two unequal powers must be kept equal. This implies a strong and constantly operating check on population from the difficulty of subsistence."

He defined the checks as follows: "The positive checks to population are extremely various ... Under this head, therefore, may be enumerated all unwholesome occupations, severe labour and exposure to the seasons, extreme poverty, bad nursing of children, great towns, excesses of all kinds, the whole train of common diseases and epidemics, wars, plague and famines."

Summarising his views, he wrote: "The truth is, that the pressure of distress on this part of a community [the poor] is an evil so deeply seated that no human ingenuity can reach it." North America provided the evidence that population could increase in geometrical ratio. Malthus noted that, "In the northern states of America ... the population has been found to double itself, for above a century and a half successively in less than twenty-five years It may safely be pronounced therefore, that population, when unchecked, goes on doubling itself every twenty-five years, or increases in a geometrical ratio."

On the question of food supply, he wrote: "the means of subsistence, under circumstances the most favourable to human industry, could not possibly be made to increase faster than in an arithmetical ratio."

Preventive checks

Malthus visited Germany, Scandinavia, and Russia in 1799 and France and Switzerland in 1802, accumulating material, which was incorporated into the second edition, published in 1803, under his own name.² Significantly, the subtitle was altered to "Or a view of its past and present effects on human happiness, with an inquiry into our prospects respecting the future removal or mitigation of the evils which it occasions."



Fig 1 John Linnell's portrait of Malthus in 1833, aged 67. (Reproduced with permission of the governors of Haileybury and Imperial Service College)

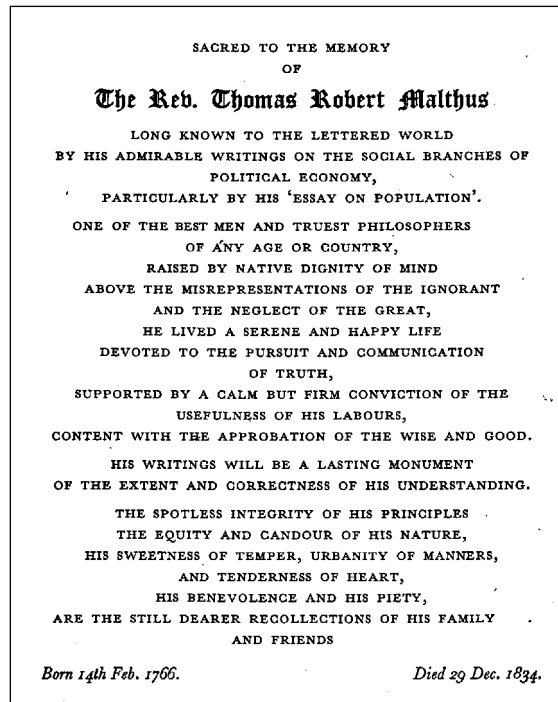


Fig 2 Memorial to Malthus in Bath Abbey. (From *The Malthusian population theory* by G F McCleary. London: Faber and Faber, 1953.)

Appreciating now that population was not controlled solely by positive checks, Malthus introduced the concept of "preventive checks." He divided them into those arising from "vice" and "moral restraint," by which he meant chaste restraint from marriage—that is, late marriage without previous sexual liaisons, and restraint within marriage, with voluntary restriction of the number of children. Preventive checks arising from vice were: "Promiscuous intercourse, unnatural passions, violations of the marriage bed, and improper acts to conceal the consequences of irregular connexions." According to Malthus, the "lower orders" had lost their self respect and were marrying young and producing more children than they could support.

Malthus's solution

Malthus advocated the gradual abolition of the poor laws with safeguards against undue distress, but retaining the threat of economic hardship. He thought that "the fear of want, rather than want itself, that is the best stimulus to industry."

In spite of this approach he was able to write a shockingly repressive passage (not in the sixth edition): "A man is born into a world already possessed if he cannot get subsistence from his parents on whom he has a just demand, and if society do not want his labour, has no claim of right to the smallest portion of food, and, in fact, has no business to be where he is. At Nature's mighty feast there is no vacant cover for him. She tells him to be gone, and will quickly execute her orders."²

Malthus proposed that the working classes should copy the habits of the middle classes, who married late and had small families. He had a poor opinion of the upper classes: "Those among the higher classes, who live principally in towns, often want the inclination to

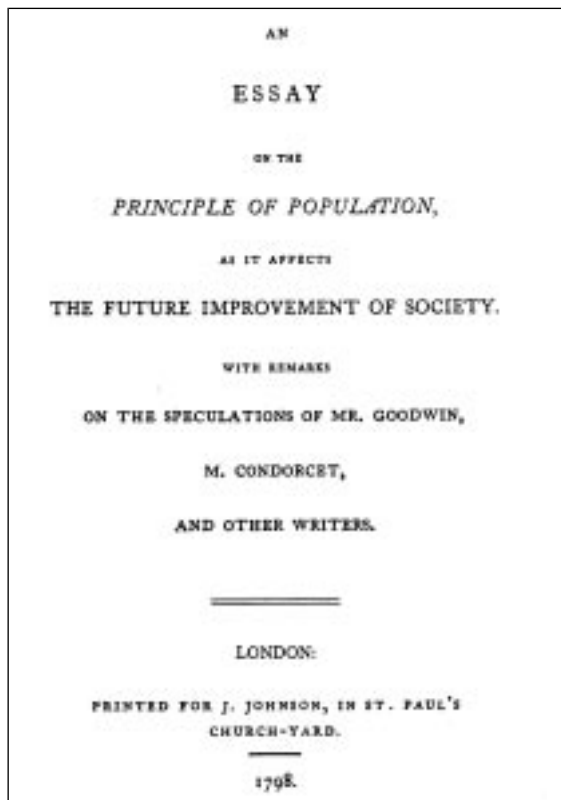


Fig 3 Title page of the first edition. Godwin's name is misspelt

marry, from the facility with which they can indulge themselves in an illicit intercourse with the sex."

To promote his views, Malthus advocated universal primary education: "[We] have been miserably deficient. It is surely a national disgrace, that the education of the lower classes of people in England should be left merely to a few Sunday Schools, supported by a subscription from individuals, who can give to the course of instruction in them any kind of bias which they please."

The other side of Malthus

Malthus had a humane side to his character. He condemned the social evils resulting from the industrial revolution and was concerned about the ill treatment of illegitimate children and the high mortality of children in the towns. "In London, according to former calculations, one half of the born died under three years of age."

He attributed this to poor housing and atmospheric pollution: "There certainly seems to be something in great towns, and even in moderate towns, peculiarly unfavourable to the very early stages of life ... it arises from the closeness and foulness of the air, which may be supposed to be unfavourable to the tender lungs of children."

Changes in England

To understand Malthus's ideas and the reasons his policies failed, it is necessary to review the social, economic, and demographic changes which were occurring at the time. The economic situation of the agricultural labourers was deplorable. The enclosure

movement meant that they had lost their security of employment, their cottages, and the common rights which had given them some independence.³ Many families became destitute and were forced to live in the workhouses.

Between 1731 and 1811 the population almost doubled and the price of food increased two and a half times.⁴ Concurrently, fertility was rising, reaching a peak in 1790, and real wages were falling, with a nadir in 1811 (fig 4). On 6 May 1795 the magistrates at Speenhamland in Berkshire, in an effort to alleviate distress, introduced supplementary "wages," tied to the price of bread, for "all poor and industrious [employed] men." This reduced the agricultural workers to dependent paupers, placed an intolerable burden on the parish, and encouraged landowners to keep wages low.

Malthus attributed the rising population to this dependency culture, which, he thought, encouraged early marriage and large families. He feared social unrest, even revolution, due to food shortages. There were serious food riots in 1816.

For 250 years before Malthus, population had been linked to the price of food, with the prices increasing faster than population. Between 1811 and 1871 the population again doubled, but this time food prices fell, then stabilised; this was due to improvements in agriculture and to the economies of scale resulting from the enclosures. Wages began to rise, due to the demand for labour by the industrial revolution, and continued to rise for the rest of the century (fig 4).

There were also demographic changes. In pre-industrial England the working classes practised virtually no birth control—coitus interruptus was thought to be injurious to health. Fertility was determined by the ability of a couple to afford to marry and have children. This meant late marriage and small families. Though Malthus did not discuss infanticide or abortion, Darwin regarded infanticide, particularly of female infants, and abortion, as important positive checks.⁵

According to the preindustrial pattern, the coincidence of stable food prices and rising wages should have caused fertility to rise. Instead, from 1840



Fig 4 Gross reproduction rates in five year cohorts compared with 25 year moving average of real wage index. Gross reproduction rates, which were used by Wrigley and Schofield as an index of fertility,⁴ are age specific birth rates of women. (Reproduced from *The Population History of England 1541-1871* with the permission of the authors and publishers)

onwards, fertility began to fall and continued to fall until the end of the century (fig 4). This was because contraception (the vaginal sponge had been introduced from France, coitus interruptus was now acceptable, and condoms had been used mainly to avoid venereal disease from prostitutes) had become respectable and couples were choosing to limit their families and to enjoy increased material comfort.

Malthus was violently opposed to contraception and only referred to it obliquely: "A promiscuous intercourse to such a degree as to prevent the birth of children seems to lower in the most marked degree the dignity of human nature."

Conclusion

Malthus advocated several socially progressive ideas but these were never implemented in his lifetime. His social policies were defeated by a combination of socioeconomic progress and by the acceptance of an

effective preventive measure, which he had refused to recognise. His lasting contributions, however, were the concepts of the tension between population and food supply and the positive and preventive checks to population.

For almost a century Malthus's ideas were regarded as obsolete but the Club of Rome's *The Limits to Growth* revived the Malthusian analysis by pointing out the limitations of food supplies and non-renewable sources of material and energy to cope with the population explosion.⁶

- 1 *An essay on the principle of population*. 1st ed. London: J Johnson, 1798.
- 2 Malthus TR. *An essay on the principle of population*. 2nd ed. London: J Johnson, 1803:531.
- 3 Hammond JL, Hammond B. *The village labourer 1760-1832*. Abingdon: Fraser Stewart, 1995:100.
- 4 Wrigley EA, Schofield RS. *The population history of England 1541-1871*. London: Arnold, 1981:403.
- 5 Darwin C. *The descent of man and selection in relation to sex*. London: Murray, 1871:134.
- 6 Meadows DH, Meadows DL, Randers J, Behrens WH. *The limits to growth*. New York: Universe Books, 1972.

Sailors and star-bursts, and the arrival of HIV

Edward Hooper

Tracking the origins and early history of a newly recognised disease is more than just an academic exercise. To appreciate how a disease began can help medical science to combat it. The classic example is John Snow's investigation of the cholera epidemic in Golden Square, London, in 1854: his removal of the handle of the Broad Street pump contained the outbreak.¹ An appreciation of causation may also help to prevent similar events occurring in the future. The recent evidence, for example, about the origins of new variant Creutzfeldt-Jakob disease²⁻³ will, hopefully, sensitise those research scientists who are transplanting baboon livers in humans to the potentially catastrophic impact of zoonoses—human diseases acquired from animals.⁴

Three outbreaks of AIDS ...

In the case of AIDS, three related but distinct causes have been recognised in the past 16 years—namely the three human immunodeficiency viruses (HIV-2 and HIV-1 groups M and O). It is now widely accepted that HIV-2 is the result of a zoonotic transfer of a simian immunodeficiency virus from the sooty mangabey (a species of African monkey). HIV-1 groups M (for "main") and O ("outlier") seem to result from two separate zoonotic transfers of different variants of simian immunodeficiency virus in chimpanzees.

HIV-1 group M has probably caused over 99% of the world's 12.9 million cumulative AIDS cases to date⁵; by contrast, group O has probably caused less than 0.1%, perhaps because the virus (like HIV-2) is less transmissible. None the less, the rarer HIV-1 may also have lessons to teach us.

Summary points

Learning about the origins of a disease may help us to control it and also to prevent similar diseases arising in the future

The earliest confirmed case of AIDS in the world was in a young Norwegian sailor who was infected with HIV-1 group O—probably in Cameroon in 1961-2

The earliest evidence of HIV-1 group M is from 1959 and of HIV-2 from 1965. It seems, therefore, that all three HIVs may have emerged around the same time

Phylogenetic evidence shows that HIV-1 groups M and O show a "star-burst" phylogeny, with different subtypes suddenly emerging around 1959

Opinion is divided about whether this star-burst arose from the natural transfer of simian immunodeficiency virus to humans or from iatrogenic introduction—for example, through a vaccine

Two mariners ...

Earlier this year, characterisation by polymerase chain reaction sequencing of an archival HIV-1 isolate from a 29 year old Norwegian former merchant seaman showed that he had been infected with a group O

PO Box 4087,
Worthing
BN14 7LQ
Edward Hooper,
writer and medical
researcher

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virus.⁶ With this announcement, another piece of the jigsaw of the early history of the HIVs has slotted into place.

The Norwegian sailor died of AIDS in 1976, at the age of 29, as did his wife and youngest daughter, born in 1967. Since the debunking of the case of the sailor from Manchester who died in 1959 with symptoms of immunosuppression (but not, it would appear, HIV infection),^{7,8} the members of this Norwegian family now represent the earliest confirmed cases of AIDS. The first symptoms appeared in 1966 in the sailor, in 1967 in his wife, and in 1969 in their daughter.

■ *“To appreciate how a disease began can help medical science to combat it”*

The great majority of group O isolates come from people originating from west central Africa, and in particular Cameroon and Gabon.⁹ The central and coastal provinces of Cameroon (containing, respectively, the capital, Yaoundé, and the main port and commercial centre, Douala), have the highest current prevalence of group O, which causes just over 5% of all HIV infections in these two regions.¹⁰

The Norwegian sailor's maritime history is interesting. Between 1961 and 1965 he travelled the world's oceans, calling at ports in all six inhabited continents. On his first voyage, which began in August 1961 just after his 15th birthday, he worked as a kitchen hand on a Norwegian vessel that sailed down the west African coastline, calling at ports in Senegal, Guinea, Liberia, Côte d'Ivoire, Ghana, Nigeria, and Cameroon (almost certainly Douala). A gonorrhoeal infection during this trip shows that he was already sexually active. He returned home in May 1962, and apart from a two day stopover in Mombasa, Kenya, in 1964, he never returned to Africa (K F Wefring, personal communications, 1993, 1994, 1997). The sailor was, however, most unlikely to have been infected in Kenya, for only one group O isolate has been identified from that country—and that in 1995-6.¹¹ No evidence exists to suggest that the sailor was bisexual, which means that sexual contact with a woman in Douala is the most straightforward explanation for his infection. This would suggest that HIV-1 group O has been circulating in that part of Africa for at least 35 years.

■ *“Early, sporadic cases of any new disease tend to be missed”*

Between 1969 and 1973 or 1974, the Norwegian sailor experienced a remission of symptoms and was employed as a long distance lorry driver, ferrying goods to various destinations in Europe, including Germany, France, Belgium, Holland, Switzerland, Austria, and Italy. Seventy per cent of these journeys were to Germany, and his major pickup point for return cargoes was at Wesseling, 16 km south of Cologne. Former work colleagues believe that dur-



Route of the Norwegian sailor's first voyage, between Oslofjord (Norway) and Douala (Cameroon), August 1961 to May 1962

ing the course of his travels he had sex with various women, including prostitutes. In this context it would be interesting to know whether the German musician who died in Cologne of clinically defined AIDS in 1979 (and whose first symptoms appeared in December 1976)¹² was infected with HIV-1 group O. The musician was bisexual (not homosexual, as previously reported), and apparently used to hire female prostitutes to participate in orgies. Tissues from the postmortem examination are still in existence.

The next likely case of group O infection to feature in the literature is the second child of a French barnmaid from Reims, who died in 1981 “following a clinical history highly suggestive of neonatal AIDS”; in 1992 a group O virus was isolated from the mother, who by then had AIDS.^{13,14} It may be significant that a major lorry route between Liège and Lyons—two of the Norwegian sailor's delivery stops—runs past Reims. Alternatively, since Reims is a garrison town, the woman's sexual partners might have included members of the French military who had served in Cameroon.¹⁵

The first group O isolate to be partially characterised and reported in the literature was the Cameroonian ANF70, in 1990.¹⁶ Given the Norwegian sailor's sexual history, this long gap between earliest known infection and scientific recognition may seem surprising. There are, however, various possible explanations. One is that in 1961-2 the group O virus might have been new to *Homo sapiens* and not yet well adapted to transmission among humans. Another is that group O may be intrinsically less transmissible than group M, as suggested by the fact that the Norwe-

gian sailor's first two daughters, born in 1964 and 1966, are both HIV negative. What this also shows, however, is that early, sporadic cases of any new disease tend to be missed.

Especially for a lentivirus like HIV, a considerable lag time may occur between the earliest known appearance in humans and its recognition as a cause of illness, which generally occurs when sufficient cases exist to establish a pattern. In the case of HIV-1 group M, we have reliable evidence that the seed was present in humans as early as 1959 in what is now Kinshasa, Congo,¹⁷ and yet the dreadful first flowering in American homosexual men only came to the notice of the medical profession in 1981.¹⁸ We now know that other cases of AIDS occurred in the Congo during the 1970s^{19 20} and possibly as early as 1962 (J Sonnet, personal communication, 1992),²¹ but the significance of such cases was recognised only retrospectively, once the syndrome and its viral cause had been identified. This highlights the worrying possibility that other HIV variants may already be spreading, unrecognised, in humans.

In 1994 Gerry Myers of the HIV sequence database reported that HIV-1 groups M and O both exhibit star-like phylogenetic trees, and proposed that the divergence of different subtypes within both these groups might have occurred around the year 1959.^{22 23} This is consistent with the molecular clocks proposed by many geneticists²⁴⁻²⁶ and with the fact that no HIV isolate has yet been discovered from before 1959. Others have referred to this divergence as a "big bang,"²⁷ though perhaps the best image is that of a silent star-burst,²⁸ viewed years later across space and time, perhaps by a sailor on night watch in the midst of a dark ocean.

... and a monkey puzzle tree

Speculation abounds about why the two explosive HIV-1 divergences should have suddenly occurred around the end of the 1950s. In fact, there might even have been three roughly contemporaneous star-bursts, as the earliest epidemiological evidence of all three HIVs pertains to the same time period—1959 for HIV-1 group M, 1961-2 for group O, and 1965-6 (in different parts of west Africa) for HIV-2.^{29 30}

Proponents of the "natural transfer" school believe that simian viruses may have been transferred to humans during the skinning and butchery of chimpanzees and sooty mangabeys or the keeping of these primates as pets. They seek to explain the synchronicity of divergence and spread of the HIVs by proposing that urbanisation and new sexual freedoms around the time of decolonisation brought these rare human viruses in from the bush.

Others, members of the iatrogenic school, believe that the hand of medical science may have played an unintended role. They propose that the capture of monkeys and apes for scientific purposes, or the administration in Africa of vaccines made in substrates of primate kidney, may have been the initial means whereby the precursor simian viruses were transferred to humans.³¹ Many of them believe that the star-burst phenomenon is suggestive of several simultaneous iatrogenic transfers.

Perhaps when further isolates of simian immunodeficiency viruses from chimpanzees and sooty mangabeys and archival HIV isolates have been sequenced, we shall have greater insight into the question of where, when, and how the HIVs came into being, and how best to minimise the risk of further zoonotic disasters in the new millennium.

Much of the information in this article is based on tape recordings and notes of interviews between EH and various scientists or on personal letters from those scientists. The map is based on an original drawing by Sally Griffin.

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*The electronic future***What might an online scientific paper look like in five years' time?**

Scientific journals are centuries old, but the electronic publishing revolution is finally making an impact on them. We asked six people involved in electronic publishing to describe how an online "paper" might look in five years' time.

Length—and other strengths

Lisa Bero

Institute for Health Policy Studies,
University of California, San Francisco, 1388 Sutter Street, San Francisco, CA 94109, USA
Lisa Bero,
associate professor
bero@cardio.ucsf.edu

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The main advantages of online publication are less concern about page limits, the possibility of hypertext links to other sources of information, the ability for interaction, and imagery.

So, in five years' time, scientific papers may be very long. With a click of the mouse button, the real data behind the tables could appear and readers will be able to critically appraise a paper on the basis of more complete information. Overall, reporting should improve because all methodological details of the published research will be available. An unanticipated side effect of better reporting may be that fewer papers are accepted by journals, as peer referees will know when an author is trying to pull the wool over their eyes.

Hypertext links will make each individual scientific paper a gold mine of supporting information. Readers will be able to click on references as they are cited and learn whether the references actually support the point made by the author. Authors will also be able to link to their own, and others', relevant previous work—and readers will be helped to put new research in the context of what has come before. Data that were previously available only by request from the authors or from data storage services, such as the National Auxiliary Publication Service, will be accessible through hypertext links.

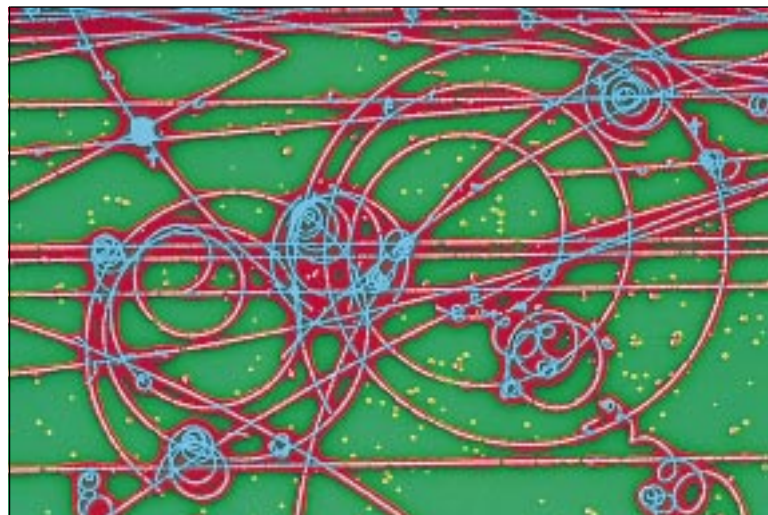
Online publication offers the opportunity for interaction. In five years' time, letters to the editor will be replaced by letters to the author. Authors will respond to comments that are submitted electronically by readers—and if they don't, their lack of response will be noted. Each scientific paper will become a living document that evolves in response to readers' feedback, as is currently seen in the Cochrane Library.¹ Readers will have to learn to revisit papers in order to keep up to date with new interpretations of the research.

The imagery and interaction available through online publication will allow readers to manipulate data to test the assumptions made by authors. For example, readers could test the robustness of a finding by using an option to recalculate data using different statistical tests. Or, readers could select graphical display of data as percentage change versus absolute change to determine whether the authors' conclusions depend on the type of presentation. Such transparency in data analysis could well lead to more letters to the author.

Lastly, let's not forget about the authors and imagery. In five years' time, the credit system of authorship will be widely used. In addition to reading a description of what each author contributed to the paper, the reader will also be able to link to pictures of the authors in action. For example, one author may have contributed thinking (image: feet up on desk, gazing into space), while another may have contributed statistical expertise (image: statistician arguing with principal investigator). Thus, the potentially cold and impersonal world of online communication will take on a more human face.

Material that is supplementary to a published paper may be stored electronically and obtained by the reader of the paper for a small fee through the service provided by the National Auxiliary Publication Service c/o Microfiche Publications, PO Box 3513, Grand Central Station, New York, NY 10163-3513, USA.

1 www.cochrane.co.uk (Up to date information on access to internet versions of the Cochrane Library.)



PATRICE LOPEZ, GERNISPL

From snapshot to movie

Tony Delamothe

Within five years most readers and researchers will have understood that the scientific paper, despite its illustrious history, was merely a passing phase. Before the internet, papers were undoubtedly the best way to communicate the results of research to peers who weren't physically present. A fixture in the academic landscape, the many limitations of papers were hardly noticed.

But the scientific paper never approximated even vaguely to real life; Medawar went as far as to call it a fraud. The world wide web will make honest men and women out of researchers: at last they will be able to tell it like it is. Freed by the web of constraints on space, they will be able to share the entire trajectory of their research project as it unfolds, to everyone in the world with web access.

The "virtual article" could start with the primeval soup of discussion, debate, and previous research from which their research question arose. Following this would be the protocol, raw data and analysis, and conclusions—and how these have been refined in response to comments from peer reviewers and others (which would all be available for perusal). Despite the abundance of material clear signposting and site design would keep the computer screen uncluttered and might even allow the main message of the research to emerge with greater clarity than at present. All content could be downloaded from the site and printed out on paper if required.

Comments from the authors or readers could be appended to the work long after it has been completed; links could be followed to articles that subsequently cite it (forward referencing). Closure need never occur; the scientific paper that we know and love will come to be recognised for what it is—one moment in the history of an idea, frozen in time, like a black and white snapshot. True, still photographs have their power and fascination, but most of us opt for moving images.

The research project can be available as it unfolds, to everyone in the world with web access, at a cost many times lower than paper journals. Science could eventually become the more open, collaborative endeavour that its propagandists claim it to be.

Of course, this Utopian vision leaves many issues unaddressed. For example, who guarantees the quality of material, and who is responsible for providing access to it after institutions have folded and individuals moved on (functions currently fulfilled, with varying success, by journals)? How will interested parties find their way to relevant material, given the bluntness of current search tools on the web? Will some higher authority be needed to ensure that researchers will post negative as well as positive comments on their work and to adjudicate in disputes over plagiarism and theft? So much has become possible in such a short time that it seems unlikely that these issues will present enduring obstacles.

BMJ, London
WC1H 9JR
Tony Delamothe,
deputy editor
tdelamothe@
bmj.com

Variation adds value to the author's logic

Anne Dixon

A primary research article purports to be an objective record of a discrete piece of work that addresses, in sequence, the introduction of the problem at issue, the approach and methods adopted, the results, and the conclusions to be drawn. One of the key questions for publishers of scientific papers is whether and how one can retain the author's logic but also provide the variety, segmentation, and ancillary information that electronic publishing can allow, and which end users may want.

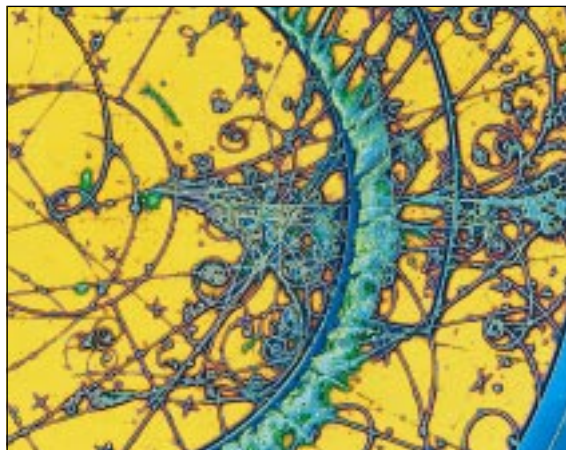
But firstly let's look at the work of scientists themselves. In five years' time it will be almost inconceivable that some part of their work, or more likely all of it, will not have been created using computing power. The output could be data, tables, pictures, texts, sound, images, animations, computable formulas, three-dimensional movable structures, simulations, URL addresses, or other unique identifiers. Furthermore, during the preparation of their articles the authors may well have already segmented the content by using headings and other textual devices or by electronic methods.

Once the paper is submitted to a publisher or other content provider, the refereeing process (if indeed there is one) may build on these elements, altering the context of the content to aid comprehension and clar-

ity and suggesting further information trails for readers to follow. Open or semimoderated peer review may be favoured by the publisher or author, or both, and this creates its own issues in terms of fixing the state and status of the work in time, and establishing priority and ownership of the work. In this context there may never be a "final version" of the work; rather, it will be a "living document," with its own ecosystem.

Once a publisher or content provider has completed the refereeing process (if such exists) the article manipulation process begins. This is where the bulk of the "new" work occurs for publishers: format conversion; storage; cataloguing; adding identifiers; adding metadata; determining and implementing segmentation; imposing security, validation, or terms of trade layers; adding or identifying further crosslinks or keywords; data processing; database insertion; and improving or standardising multimedia elements. This is the new added value publishers can and will bring to the article. Once these considerable tasks have been undertaken the article will reside in at least one of the publisher's databases, quite possibly in several formats and versions. Further manipulation is required to pre-

Institute of Physics
Publishing, Bristol
BS1 6BE (<http://www.iop.org>)
Anne Dixon,
electronic publisher
anne.dixon@
iopublishing.co.uk



pare the content for different delivery methods, be they print, online, or portable digital medium.

Now we get to the appearance of the article. It could look exactly as the author intended it to appear; or, as is the case with many existing electronic journals, it could emulate the print product; or its segmentation and appearance could be determined by the user, author, publisher, customer, or other authority. We already have

examples of this: an article does not have the same appearance on a preprint server as when it is later published; articles offered by different aggregators have different levels of functionality; personalised services allow for a range of different interfaces; and intuitive filtering, where content is sent to users on the basis of their previous behaviour, will shortly be a reality. It is unlikely that there will be a lessening of this differentiation; indeed, it is bound to increase as content providers become increasingly competitive. The big question is, "When is great variation in presentation not of value to the reader? And in which circumstances should certain articles warrant great variation, and others not?" The review article is a more obvious candidate for segmentation, for example, than a rapid communication.

Finally, we need to ask, "What becomes of the authoritative archive?" Is it the author's accepted text, the relevant parts of the publisher's database, the first version published in the first medium available, the version sent to a national deposit library, or the latest version available, with all the added functionality which has been created since the article was first published? These questions will continue to haunt us. I look forward to learning the answers.

Looking to the future: amazon.com and four trends

Ronald E LaPorte, Akira Sekikawa, Deborah Aaron, Rimei Nishimura, Benjamin Acosta

Global Health Network, WHO Collaborating Center, Department of Epidemiology, Graduate School of Public Health, University of Pittsburgh, Pittsburgh, PA 15261, USA (www.pitt.edu/HOME/GHNet/GHNet.html)

Ronald E LaPorte,
professor

Akira Sekikawa,
fellow

Deborah Aaron,
research assistant

Rimei Nishimura,
fellow

Benjamin Acosta,
fellow

Correspondence to:
Professor LaPorte
rlaporte@vms.cis.pitt.edu

Amazon.com is the world's largest bookstore and currently the most successful enterprise on the internet. In amazon.com one can:

- Easily find books by browsing;
- Find books that are the most read;
- Identify books recommended and reviewed by experts;
- Find award winning books;
- Examine ratings and reviews by peers;
- Rate and review books for other readers;
- Select and pay for books directly on the internet;
- Have new books selected on the basis of previous choices and pushed onto your computer.

Substitute the word "journal" for "book": this is the future of scientific publication. Amazon.com is a model of a successful, efficient, constantly evolving internet information broker. Scientific journals will emulate it.

In addition to amazon.com there are four trends.¹⁻²

Competition—Now, publishers have a monopoly on scientific communication; this will soon fall. Scientists will bypass journals and put research directly on the web.³ A second competitor will be Silicon Valley companies like Microsoft or amazon.com. These aggressive information brokers will "eat their children" by evolving cutting edge information technology for dissemination of scientific information.⁴ The competitors will improve service and drive down costs; as a result, many journals will go belly up.

Cognitive based presentations—Powerful new cognitive formats will evolve; as this happens, the traditional format of Abstract, Introduction, Methods will become extinct. One new format is called "Hypertext Comic Book"; here learning is enhanced by iconic "cognitive"

paradigms.⁵ The user points and clicks to icons for medical knowledge. In 2002 the medical literature will have no rigid style. Instead, cognitively based formats which maximise interactivity, hyperlinks, and memory will evolve.

Comprehension translation—This 1997 article appears in only one format; one size fits all. In 2002, people will indicate their backgrounds, and software called Intelligent Agents will individually tailor a semantic translation to maximise comprehension. Thus an epidemiologist will see a very different article than a surgeon or bus driver.

Convergence—Researchers currently do not communicate well with clinicians, public health workers, or the lay public. People in different disciplines will converge to global internet chat rooms to discuss new research. Having researchers transfer information directly to the consumer rather than through paper journals or the media will allow much faster and more accurate diffusion of scientific information. Convergence will also bring scientists to the schools. Scientists will "push" new information into schools via internet lectures.⁶ Convergence will also take place as the distinctions between the latest scientific findings, lectures, journals, and books become blurred. Schools, books, and lessons will have information days old rather than years or decades old.

The future is bright: there will be better quality, improved access, and lower costs with the emergence of scientific information based, amazon.com-type companies.

1 <http://www.bmj.com/bmj/archive/6991ed2.htm>

2 <http://www.bmj.com/archive/7072fd2.htm>

3 www.pitt.edu/HOME/GHNet/publications/assassin/index.html

4 www.pitt.edu/~rlaporte/prague.html

5 www.pitt.edu/~debaaron/hicb.html

6 www.pitt.edu/~super1

It could fulfil our dreams

Faith McLellan

This holiday season I'm dreaming ... of an online scientific paper that is flexible, accessible, and exceptionally friendly for its diverse users. Like most dreams, this one takes no account of cost, technical feasibility, or any of the other headaches of publishers and proprietors. It does acknowledge that authors may already feel overburdened with publication tasks and that readers may be overwhelmed by enormous amounts of information. So despite the virtually limitless terrain of cyberspace, my online paper of the future is still marked by a core IMRAD [introduction, methods, results, and discussion] or other conventional structure, economy of expression, judicious presentation of data, and editorial expertise. Here are a few scenes from this dream:

... a link from the authors' names to their email addresses or other accurate, regularly updated means of contact

... a short summary of the paper's key points, written in plain language. Editors of online journals report heavy traffic from lay readers, so why not make the message accessible to the public?

... links to detailed descriptions of experimental methods

... links to often cited but infrequently available documents, such as the Declaration of Helsinki

... drug, chemical, and equipment names that are linked to a contact for the manufacturer—not to be construed as advertising, but for the convenience of readers in need of the same materials

... links to a schema of the experimental setup, or to a graphic representation of the experimental design

... results that are available on demand in both graphic and tabular form

... statistical methods that are linked to a short description of the tests' mechanics and appropriate uses

... discussion links to speculative ideas—schematics of possible mechanisms, tentative next steps

... references with links to the full text of the cited works

... case reports that might include a short account by

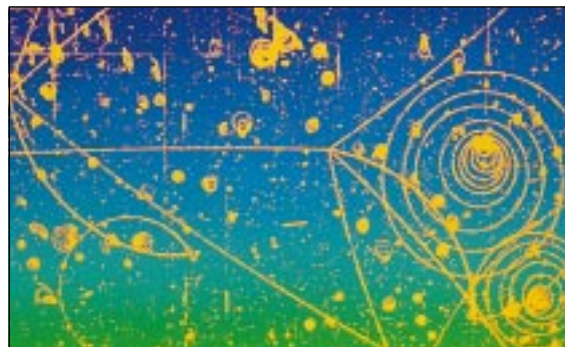
patients of their experience of the particular illness, thus providing a perspective that is often missing and another piece of "evidence"

... a didactic "overlay" on selected papers that would examine their content and structure from one of several perspectives, including how to write or review this kind of paper, how to statistically analyse this type of data, or how to use this article in clinical practice—an electronic writing, peer review, or statistical workshop, or journal club

... links, with the consent of all concerned, to reviewers' comments on the published version of the paper

... a mechanism for readers to transmit concise comments that can be edited and linked to the paper.

Specific features of the online scientific paper can be fluid, a synthetic product of the creative expertise of authors, readers, editors, information management specialists, and web site designers. Appropriate to the electronic medium, the paper's form should be lively and open and attentive to the needs of an expanding audience. Appropriate to the scientific method, its design should be tested for usefulness and applicability and then modified as necessary, according to data driven processes. The dream will then culminate in an electronic paper that mirrors some of the highest qualities of science and medicine—rigour, serendipity, compassion.



LAWRENCE BERKLEY LABORATORY/SPL

"Papers" will still exist

Peter Newmark, Vitek Tracz

The very term "paper" is inescapably bound up with the printed word and has no real place in the context of "online." It carries with it clear notions of space limits, formats, and information packaging that have become an integral part of the way science is currently communicated.

Printed papers are the manifestation of the quantum theory of publishing. Scientists accumulate data, publish them, and repeat the process over and over again.

The size of papers varies somewhat, with authors intent on increasing their publication list slicing their work much more thinly than others, but quanta are inherent to print publishing.

Online publishing could hardly be more different. Gone is the need to print discrete quanta of information that are forever fossilised in their moment of time. Instead the wave theory of publishing can manifest itself. Online publications can change with time, recording the development of ideas as research progresses. Publications could be regularly archived as a historical record, but the live publication would evolve continuously. Moreover, all collected data would be attached to the publication so that, although the authors would still select what they need to make their point, readers would be able to access all the data and apply their own interpretation—in all probability with a set of customised artificial intelligence tools.

Department of Anesthesiology, University of Texas Medical Branch, Galveston, TX 77555-0830, USA
Faith McLellan, *director, manuscript and grant preparation service*

mclellan@marlin.utmb.edu

Current Biology Ltd, London W1P 6LB

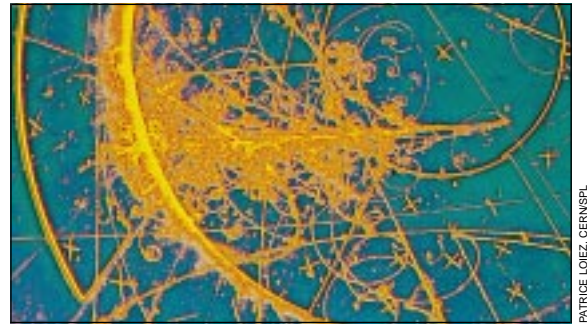
Peter Newmark, *editor, Current Biology*

Vitek Tracz, *chairman, Current Science Group*

Correspondence to: Dr Newmark peter@cursci.co.uk

But we have to admit that there is not a chance that this is what an online publication will be like in five years' time. To make such radical changes, a whole set of ingrained ways will need to be changed. For example, the refereeing system for papers, which is built on the premise that small discrete quanta will be reviewed, will need to evolve to cope with the wave theory of publishing, as will the idea that promotion can be based on measuring discrete quanta of publications. This may take not five but 50 years.

In five years' time, online publications will still closely resemble papers, albeit with added bells and whistles. Some will contain many more data than can be squeezed into a printed paper: perhaps the raw data as well as the distilled version, and the graphical results of all experiments instead of a "typical example." Movies or animations will replace or complement the static illustrations of printed papers. References will be linked to the full text of the referenced paper and to



PATRICE LOIEZ, CERN/SPL

lists of related papers and reviews automatically selected on criteria of relevance. And the text of many papers will be rich with links to databases and other websites. Some readers will find these fascinating, others will find them distracting, and most will probably still print out on paper what they really want to read.

And we'll probably still be busy thinking up a new name for the online scientific "paper" of the future.

Something for everyone

Richard Smith

BMJ, London
WC1H 9JR
Richard Smith,
editor

Electronic publishing will turn scientific "papers" from dead documents into live ones. Vitek Tracz, founder of Biomednet and one of the contributors above, has called scientific papers "quasilegal documents." They are written not to be read but for scientists to defend, justify, and support what they have done. They may even deceive in that they suggest an order that almost certainly wasn't there in the research itself. And once published they are frozen. Many criticisms and suggestions may be offered, but these appear months after the paper is published, and the paper itself cannot be modified as a result. The best we can manage in paper publishing is a correction and linked correspondence, perhaps with a response from the authors of the paper.

Nobody can know with confidence what a "scientific paper" will look like in five or 10 years' time, when electronic publishing is the primary means of communication in all of science (not just physics), but we can begin to guess. Electronic papers (an oxymoron) will have many layers. They might comprise: a structured abstract; a simple paragraph on what they are about; a "news story" written in several styles and in several languages; something close to our current papers, although probably at much greater length; underlying instruments (like questionnaires) and data, together with the software used by the authors to manipulate those data; links to papers mentioned in the references, preferably in full text; full information on what searches were done to find previous work; links to descriptions at several levels of complexity of all standards methods used; full access to all relevant work that has gone before; and much more that we can only begin to imagine. The "much more" might include a video of the scientists describing what they did, perhaps in interviews; detailed information on the researchers and their institutions; conversations with practitioners on what the results might mean for clinical practice; debates on any ethical

points; and comprehensive information on any conflicts of interests.

Probably nobody will access all of this information, and one of the great benefits for editors will be that we will finally have a means to meet the competing demands of authors and readers. Authors often want to give very full information, whereas many readers, particularly those who are practitioners rather than researchers, want "the bottom line, the message." Already we see paper and electronic publishing as complementary: we will move increasingly to shorter, sweeter, more readable papers in the paper journal and fuller papers on our website.

And the electronic papers will be alive. They will be accompanied eventually by all the debate that went on as part of the peer review process (often, in my experience, more interesting than the papers themselves); correspondence in response to the papers will be posted immediately on our website; and the papers will be modified in response to the criticisms and suggestions and updated in the light of new and important information from other work. Perhaps a world where nothing is fixed will be hard to follow, but I think that the world represented by symbols on paper or screens may then come much closer to the ever changing world we all inhabit. I'm excited and optimistic.

Competition

We would like to know your predictions for what an outline scientific paper will look like in 5 years' time. Submissions, which will be posted on our website, should be no more than 400 words long and should be received by 31 January 1998.

The winning entry will be announced in our Christmas 2002 edition and will be decided by comparing predictions against contemporary scientific articles appearing in online versions of the *Annals of Internal Medicine*, *BMJ*, *JAMA*, *Lancet*, and *New England Journal of Medicine* (should they still exist).

The prize will be a one year personal subscription to the winner's choice of one of these five online journals.