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The spirit of occupational medicine

DOUGLAS BLACK

Before I disclaim anything remotely approaching skill (convincingly, I imagine), I should like to declare a genuine interest in occupational medicine.* This might be said to go back a long way, for the first patient whom I ever clerked in Dundee was a gill-filler in a hackle works; and a seaport full of jute mills could scarcely fail to arouse curiosity about the effect of occupation on health. But the experience which, to use a cant phrase, really turned me on to occupational medicine was reading Donald Hunter's *Lectures on Occupational Diseases*—the slim precursor of *The Diseases of Occupations*. In Oxford I worked in the same firm as Richard Browne, who alerted me to what was later to become ergonomics. The plasticity of man's performance is great; but it should not on that account be abused by correctable faulty design in the equipment which he has to manipulate. Throughout my years in Manchester I had as successive colleagues Ronald Lane, Tom Scott, and Tim Lee, from each of whom I learnt much; and, of course, Richard Schilling spent some years in Manchester before coming to the chair at the London School of Hygiene. So I think I can claim to have been in good company, and my lack of any contribution to occupational medicine must be my own fault. Nevertheless, I am proud that circumstances enabled me to be, if not a proper midwife, at least a Sarah Gamp at the birth of the new faculty.

These days I am often constrained to break at least one of the Duke of Wellington's two precepts for public speaking: "I never speak of what I know nothing, and I never quote Latin." As I survey my response to my present commitment, I am reminded of the words with which Benjamin M'Cready opened his prize dissertation for 1837, "On the Influence of Trades, Professions and Occupations, in the United States, in the Production of Diseases." To quote, "The writer of the following essay is aware of its numerous faults. He knows that his state-

ments are often too general; that many of the points touched upon are imperfectly treated of, and that others, equally belonging to the subject, have been wholly neglected." He goes on to lament the absence of statistical data, forcing him to rely on information from workmen, who, he alleges, "are so little attentive to the causes which affect their health,

Benjamin William M'Cready

*Based on the Lucas lecture given on the occasion of the first annual general meeting of the Faculty of Occupational Medicine, Royal College of Physicians, on 1 May 1979.

and their views are so often warped by prejudice or interest, that little reliance can be placed upon them." I fear that neither of these excuses for imperfection will avail me today. Statistical data abound, in the Registrar General's returns and elsewhere; and workers are no longer indifferent to factors affecting their health, as witness the TUC Centenary Institute of Occupational Health in the London School of Hygiene.

Man of Modena

As a first approach to grappling with my difficult, if self-imposed, subject I have thought it sensible to go back to the origins, and see what can be gleaned of their motivation from the pioneers of occupational medicine. Although he was preceded by men who had studied particular occupations, as, for example, Agricola and Paracelsus on mining and metal-working, the first broad survey of the effects of occupational health was made by Bernardino Ramazzini, in his great work *De Morbis artificum diatriba*, published in 1700.

Bernardino Ramazzini

Born in Capri in 1633, he practised in Modena for 30 years, for the last 20 of which he was the professor of theoretical medicine—something of a paradox, since during all that time he was entering workhouses which he himself described as “nasty and stinking,” going down wells and mines, talking to the workmen, and noting at first hand both the conditions under which they laboured and the various effects on them. A few examples must suffice. Apparently his interest was first aroused by a conversation with a man who had just emerged from a cesspit; and the thirteenth chapter of his work is entitled, “Of the diseases of the cleaners of jakes.” From this unusual starting point he ranged widely. Metal-diggers, washerwomen, potters, fullers, blacksmiths, workers with lime and brimstone, painters and glass makers, vintners and brewers, masons and husbandmen—even surgeons were not forgotten. A few fragments to give something of the flavour of Ramazzini’s writing, as translated in 1746 by Dr Robert James, a fellow of this college, of whom Samuel Johnson said “No man brought more mind to his profession.” Of learned men, he says: “We find the thorough paced scholars are thin, lean, wan coloured, morose and lovers of a solitary life. They likewise contract a weakness of the sight by degrees.”

Ramazzini knew that mercurial inunction was “injurious to the brain and nerves.” But it was also profitable; and he tells of one anointer “who knew better than the alchemists how to make a true metamorphosis of mercury into gold.” Wearing gloves was useless, as mercury penetrated the leather; but in a happy combination of reason and rationalisation one practitioner “ordered the patients to rub themselves with their own hands, by which means a double advantage is gained; for not only the surgeon avoids danger, but the patients, thus heating themselves by the motion and exercise of their arms, make the ointment penetrate better.”

Of tobacco, he recognises that “many uncommon disorders ensue upon the excessive use of it”; but, with a modern touch, he describes it as “acceptable to all the Europeans, especially in

those countries where the consumption of tobacco makes a considerable branch of the public revenue.” On these and many other solid bases of experience, Ramazzini was able to stress the genuine importance of occupation as a cause of disease. Having mentioned the questions advocated by Hippocrates, he goes on thus: “To which I would presume to add one interrogation more; namely, what trade he is of. But I find it very seldom minded in the common course of practice, or if the physician know it without asking he takes but little notice of it.”

Ramazzini’s addition of a new dimension to medicine was made with great modesty, but nevertheless with complete assurance that the work which he had begun would continue and expand, for in this preface he says: “I freely confess that what I now publish is but an imperfect performance, or rather an incitement to others to lend their helping hands, till an intire and compleat treatise is obtained, that may deserve well of the commonwealth of physick. It is certain we owe this Piece of Service to the miserable company of Tradesmen, whose Professions even if the meanest and most sordid kind, are so advantageous and necessary to mankind. This debt, I say, is due from medicine, the noblest of all sciences, as Hippocrates calls it, which gives Relief to the Poor and dispenses cures gratis.”

In that passage, and in the rest of the preface, I think we may discern the spring of Ramazzini’s energy. Recognising the benefits accruing to civilisation from “the mechanic Arts,” he sees therein a great debt which calls for repayment. No doubt, as the work went on, his original dedication was reinforced by the sheer interest of his observations. In such a conjunction of benevolent emotion and intellectual curiosity must lie a large part of the spirit that we are seeking.

We cannot tell from his writings whether Ramazzini sought fame. His early years in Modena were not untroubled by the jealousy of his colleagues, or, as Dr James puts it more picturesquely: “As the brightest geniuses sometimes meet with the keenest opposition, so a false principle of emulation, or rather a sordid and brutal malice, prompted the physicians and professors of Modena to do all they could to discredit a man whom they looked on as so formidable a rival.” Ramazzini’s countermeasure took the unusual form of an ode to Louis XIV of France, at that time ravaging northern Italy. Apparently, but not surprisingly, this did not really help. “And but little would have been needed for hostilities to press upon him openly at the time.” But whether or not he sought fame, it certainly came to him. The senate of Venice invited him to the chair of medicine in Padua, in succession to Sanctorius, and until his death in 1714 he added further lustre to that great medical school.

Pioneer from Leeds

If I may now bring to my evidence another pioneer of occupational medicine, this time in Britain, it would be Charles Turner Thackrah of Leeds. Like Ramazzini, he had been preceded by men who studied the diseases associated with particular occupations—notably Sir John Pringle in military medicine, and James Lind in naval medicine. Thackrah’s great work was published in 1831, and an enlarged second edition in 1832. It bears the indulgent title *The Effects of the Principal Arts, Trades, and Professions, and of Civic States and Habits of Living, on Health and Longevity with Suggestions for the Removal of many of the Agents, which produce Disease, and shorten the Duration of Life.*

Born in 1795, Charles Thackrah spent by far the greater part of his short life in his native Leeds, leaving it only to study medicine for a short time at Guy’s Hospital, which he entered in 1815, two days after John Keats. Returning to Leeds a year later, he devoted the rest of his life—apart, of course, from the ordinary practice of his day—to two great objects, in both of which he was notably successful. Andrew Meiklejohn describes him as “the urgent moving spirit” in the foundation of the Leeds Medical School in 1831; but here we are concerned only with

his pioneering work in occupational medicine. His contribution cannot be better summarised than by Meiklejohn: "Thackrah was not the casualty surgeon, nor an industrial toxicologist; he was a good general practitioner and clinician, keenly observant of the effects of work and social factors on the health not only of masters and workmen but on the whole community from childhood to old age. He was not the discoverer of specific trade diseases, his unique contribution to medicine was that he propounded the conception of industrial health, based on prevention of disease and the promotion and conservation of

Charles Turner Thackrah

health, physical, mental and moral." Donald Hunter says: "For comprehensiveness, first-hand clinical experience and constructive proposals for improvements, Thackrah's monograph is superior to that of Ramazzini."

Much had happened, of course, in the 130 years which separated the appearance of the two books; and nineteenth-century Leeds had a still more varied range of employments than seventeenth-century Modena, carried out under less favourable conditions. To me, the specific way in which Thackrah fulfilled Ramazzini's own expressed wish that others should build on his work lies in his addition of the epidemiological dimension. By reference to the bills of mortality, he showed that "the duration of human life is considerably less in the West Riding, the manufacturing district, than in other parts of Yorkshire." In more detail, "Comparing the mortality in Leeds with that of a town destitute of manufactures; and afterwards with that of a merely agricultural district," he showed that in Leeds in 1821 there was one death in 55 persons; in Ripon one in 67½, and in Pickering Lythe one in 74. He attributed the excess mortality in Leeds to "The injurious effects of manufactures, the crowded state of population, and the consequent bad habits of life"—thus recognising the complexity of the problems brought on in the wake of the industrial revolution.

Modesty seems to be a characteristic of the pioneers of occupational medicine—he says, "I have had, therefore, to enter a new track, without guide or friend." Even so, he says elsewhere: "The best way of learning a subject is to write on it"; and, certainly, nothing deflected him from his object, "to excite the public attention to the subject." For his analysis, he divides society into "five great classes," but they are very different from those used today: I, operators; II, dealers; III, master manufacturers and merchants; IV, men independent of business and labour; and V, professional men. Again giving evidence of his thorough approach, he says: "In examining the state of these severally, we shall advert to the atmosphere they breathe—the muscular exercise they take,—the postures of body they maintain—the variations of temperature and humi-

dity to which they are exposed—and finally, in some classes, their state of mind."

He regards husbandmen as among "those operatives who approach nearest to the perfection of the physical state," and notes that they live long. "Butchers in fact live too highly—not too highly for temporary health, but too highly for long life"; and adds, "The preventive is obvious." (Throughout his book, he lays emphasis on preventive measures, both general and specific, instancing the effect of the Davy lamp on the risk to miners.) With regard to "Chaise-drivers, postillions, stage-coachmen and guards of coaches," he notes that the advantages of an open-air life are offset by the lack of exercise. Ship carpenters have the advantages of fresh air and exercise, and are rather long lived; but he notes sadly "Grog and ale, when they can be procured, are generally taken too liberally," a warning which he frequently repeats for other trades—for example, "Gentlemen's coachmen often suffer from the excess of nourishment. Having often to wait for their masters, They fill up their time, by filling up their stomach! They also take ale too frequently." Another class subject to similar risks are commercial travellers: "They destroy their constitutions by intemperance; not generally by drunkenness, but by taking more liquor than nature requires. Dining at the traveller's table, each drinks his pint or bottle of wine; he then takes negus or spirit with several of his customers; and at night he must have a glass or two of brandy and water. We cannot refer to such conduct, except in terms of the strongest reprobation." In those days of ill-ventilated, crowded workshops, dust

Title page of Thackrah's book

diseases were prominent: "Dust is the great bane of manufacturers; and whether it be farina, animal or vegetable fibre, or evolved from minerals, stone, lime, coal or metal, it injures the respiratory organs."

Thackrah's observations extended to over 200 different occupations, many more than I can here indicate. The thread that runs through his whole narrative is purposive compassion, which I can best illustrate, in conclusion, by what he says of child labour, then so prevalent. "The employment of young children in any labour is wrong. The term of physical growth ought not to be a term of physical exertion. Light and varied motions should be the only effort,—motions excited by the will, not by the task-master,—the run and the leap of a buoyant and unshackled spirit. How different the scene in a manufacturing district! No man of humanity can reflect without distress on the state of thousands of children, many from six to seven years of age, roused from their beds at an early hour, hurried to the mills, and kept there, with the interval of only 40 minutes, till a late hour at night;—kept, moreover, in an atmosphere impure, not only as the air of a town, not only as defective in ventilation, but as loaded also with noxious dust. Health! Cleanliness! Mental improvement! How are they regarded?"

The Factory Act of 1833 brought a measure of regulation and relief to the employment of children in factories (as well as establishing a factory inspectorate), but their champion died in that same year, of the tuberculosis which he had fought against for years.

Reformers in industry

From the work and influence of such men, their successors have drawn the inspiration to effect reforms which have completely changed the industrial scene. This has been the work of many men, drawn from a wide variety of professions; I can mention only a few, and none in any detail. The general environment in which people have to live and work was transformed by successive sanitary measures that cleaned up land, air, and water, which were enacted and implemented after the lawyer Edwin Chadwick produced in 1842 his great *Report on the Sanitary Conditions of the Labouring Population of Great Britain*. Legislators such as Lord Shaftesbury promoted the series of Factory Acts which banished children from the chimneys and sweatshops, reduced hours of labour, improved working conditions, and set up an inspectorate to ensure that what was enacted should in fact be carried out. The aspects of industry covered by legislation have progressively extended until the recent Health and Safety at Work Act. Writers like J L and Barbara Hammond have made the informed public aware of the problems of industry. Enlightened employers of the stamp of Robert Owen set themselves to improve the conditions of the workers, and also their relations with the employers. The trade union movement was established in the nineteenth century, and, in 1868, a trades union congress, representing 118 000 members, met in Manchester. Scientists were active not only in devising new industrial processes and sources of energy, but also in advising on safety measures in industry. From about 1830 onwards, enlightened employers retained medical men to visit their factories, inspect the workers, and advise on preventive measures; and the Factory Act of 1844 empowered factory inspectors to appoint practitioners as "certifying factory surgeons." Periodic examination in certain dangerous trades was instituted on a statutory basis in 1891; and certificates of disablement under the Workman's Compensation Act were introduced in 1906. It was not, however, until the beginning of this century that the practice of employing a whole-time works doctor began to spread, slowly at first, until it became the established practice that it is today in larger concerns.

The revolution of the past century in attitudes to the health problems of the worker has brought immeasurable benefits to the whole of society; and I see no realism in those who hanker

nostalgically for the pre-industrial society which they never knew. Even the privileged few, who no doubt had a comfortable life in the main, were still menaced by risks to health which were not understood, and so could not be controlled in any way. For the great mass of people, industrialisation has brought opportunities that were unimagined even by the wealthy of former times. But we must still remember we are men; and I would like to sound two notes of caution on our present state.

Donald Hunter

The first is that while safety is a laudable, indeed a necessary aim, towards which we must constantly strive, it can never be an absolute. There are risks in everything that we undertake; and our selection of those which we choose to accept is, to say the least, paradoxical at times—for example, the vociferous campaign on the risks of whooping-cough vaccination must have been responsible for some mortality and much unnecessary morbidity. We should therefore take some care that our precautionary measures do not induce total inactivity. Secondly, the most corrupting industrial hazard is that of long-term unemployment; and one cannot but be concerned by those perversions of the power of organised labour that throw other people out of work. There are many occupations so repetitive in character, and at the same time so efficient in production, that shorter working hours are desirable; but there seems little sense in using this to increase the rewards of overtime, rather than to enable more people to be employed.

After that digression, I shall make comments on the present state of occupational medicine, in full recognition of the risk that I run by making them, as it were, from the outside. I have no doubt about the importance of this branch of medicine in our society, nor of the challenge which it makes to its practitioners. This is of various kinds, and is likely to attract people of correspondingly different talents, all of whom can contribute. If I am right in thinking that in the future industry will diversify still further, that new intermediates and products will enter the scene, that new sources of energy will have to be developed; then, surely, there will remain a prominent place for the clinically-oriented occupational physician, in the detection of new industrial hazards. Like his predecessor he will have to be thoroughly familiar with the conditions of work, and will have to have time and opportunity to talk with the workers, as well as with management. But those skills of observation will in future, as in the past, need to be complemented by some at least of the conspectus of the epidemiologist. Because of variations in exposure and in the way in which different people handle substances introduced into the body, it is likely that a new industrial

disease may at first be limited to a few susceptible individuals, and the association may fail to be recognised as early as it might be. The earliest possible recognition of new conditions would seem to depend on accurate records, including the recording of apparently unrelated conditions; and on frequent monitoring of them, using up-to-date methods of data processing. (This would seem to be one area which might be spared from Luddite suspicion of the computer.) Beyond his central task of detecting disease and advising on its prevention, the occupational physician should also have an informed interest in environmental hygiene, and in the techniques of health education. He should have some understanding of the problems of personnel management (sometimes known as "getting on with people"); and he cannot afford to be blind to the wider social issues of our time. In our day, as in Charles Thackeray's, much morbidity which appears in the guise of absence from work owes its existence to causes outside the factory—bad housing, unhealthy habits, even marital disharmony. It is not always the latest chemical which causes the symptoms.

The doctor cannot do much about the genetic make-up of his workers; but, in addition to exposure to specific hazards, he should be acquainted with the other main determinants of health or illness, the general environment, and behavioural factors. Monday's byssinosis may not be easy, apart from the calendar, to distinguish from Saturday's smoker's cough.

Future trends

It seems appropriate for me to say something about the part which the faculty might play in all this—emphasising, however, that the college's relation to the faculty is that of a parent, not a teacher. Like its parent college, it will have standards of practice at the centre of its concern. As part of the college, the faculty will have a stake even in the period of general professional training. The stage of higher medical training is clearly very important, as a further foundation; and here the faculty will work in close association with the Specialist Advisory Committee in Occupational Health of the Joint Committee on Higher Medical Training. Even so, what happens after accreditation is just as important—if not more important—as what goes before; and the faculty will be alert to circumstances that will enable established occupational physicians to fulfil their tasks and maintain their skill; and will also, equally importantly, take note of any circumstances that might prevent them from doing

so. The faculty cannot become concerned with terms and conditions of service, nor can it wield naked power; but it will acquire influence, the civilised vector of change. From time to time it will be called on to advise Government and other official bodies on matters within its purview. There is always a certain risk of organisations becoming choked in detail; I hope that the faculty will always remain alive to the wider issues which concern not only its members, but the whole of society. I am encouraged in this hope by the concern which it is already showing for the ethical obligations of occupational physicians. In this context I welcome the statement drafted by the Ethical Guidance Committee, which declares the primacy of the professional ethic, with its overriding obligation to put the health and wellbeing of the patient first, even when there may be a conflict of interest between employer and employee. This surely is the correct starting point of general principle, however difficult it may be to apply it wisely to the particular case, such as the airline pilot, or the disturbed or inadequate "captain of industry."

At a meeting of the Society of Occupational Medicine, I had the opportunity of speaking more generally on ethical matters; of the observations made then, I shall repeat only one here—that in becoming occupational physicians, we do not cease to be doctors, nor in becoming doctors do we cease to be citizens. If that virtual truism be accepted, what flows from it? I believe that the obligation to the individual, certainly vis-à-vis the employer, is almost absolute—but, as in so many other circumstances, not quite absolute. Where someone is a serious danger to the public at large, he should be persuaded by all available means to leave that particular employment, for a time or for keeps. I see no general solution to the dilemma which arises should he obstinately refuse to do so; a particular judgment then has to be made, balancing physical and emotional risk to the man himself against the magnitude of the risk to the public.

I would like to close with a tribute to Donald Hunter. He was one of those rare people, like Henry Miller and Richard Asher, who had that nimbleness of spirit which enabled them to cast off the fetters of absolute middle-of-the-road orthodoxy and make a distinctive individual contribution to medicine. A man of limitless energy, he was an active general physician; a pillar of the London Hospital; a Goulstonian lecturer, Harveian orator, and censor of this college; director of an MRC Unit; president of the Association of Physicians; joint author of *Clinical Methods*. All this, in addition to his writings in occupational medicine—but above all he was Donald Hunter.

LUNATICS IN TURKEY In that country the belief in the existence of a kind of diabolical possession is still rooted in the public mind so profoundly as to paralyse every official effort. Even the members of the medical faculty only a few years ago were so little impressed with the need for any study of the subject, that no provision was made for instruction in it in the one school of medicine at Constantinople. During the last two years there have been symptoms of improvement, and there is now a course of theoretical psychiatry, attendance at which however is not compulsory. From this attitude of the professional mind may easily be inferred that of the administrative authorities. Any person can be placed in confinement by the simple process of being taken to the asylum by a relative, servant, or friend. No medical certificate appears to be necessary. Sometimes to save themselves the trouble of taking a lunatic to the asylum the friends hand him over to a Government official. The patient is first taken to prison, thence to the asylum, where he is accompanied by a police order to the following effect: "The management of — hospital is requested to receive — and to confine him in the section of lunatics, he having been certified as such." Nothing is said about age, civil state, antecedents, causes, or previous morbid phenomena. It is obvious that perfectly sane persons can thus be put away very easily, and the physicians have no opportunity of learning their patient's history. If a person has been placed in an asylum by relatives they can take him out when they please; but if he has been confined by order of the police a certificate of cure must be forthcoming, and, moreover, the medical man is asked to commit himself to a prophecy that the disease will not return. In Constantinople there are 5 asylums, 1 of which is reserved for women. The most important is that of

Suleimanie, constructed by Suleiman the Magnificent, which was used up to thirty years ago, when the patients were transferred to the present asylum at Scutari. At the time of its foundation this asylum in accordance with Oriental custom had a veritable army of attendants, there being 150 for 20 patients. These were divided into different categories, at the head of which was a special officer (chief cook, chief scrubber, chief water-carrier, etc.). The patient on admission, after having a vapour bath followed by massage, was handed over to the chief barber, who shaved him completely and passed him on to the chief warder who placed him in a room. If he was violent he was entrusted to the tender mercies of the chief of the cells. In either case an iron ring was put round his neck, and from this hung a long chain by means of which he could be fixed to the wall or to the floor. In very violent cases an apparatus consisting of two pieces of wood, with semicircular openings for the hands and feet, was put on the patient. If that were not enough, the unhappy patient was flogged. In front of each room was a stand for singers and instrumental performers, who tried to soothe the captive with music. In the other towns of Turkey the asylums are simply prisons. Comparatively few women are to be found in them. This is owing to religious scruples which are so strongly implanted in the Turkish mind that they are not easily induced to allow their women folk to be placed under control unless they are very violent. In all the asylums not only Mussulmans but Christians and Jews are admitted, whether they are Ottoman subjects or not. But as all the colonies have special quarters for lunatics in their hospitals it is rare to find non-Mussulman patients in the Suleimanie. (From the *British Medical Journal*, 1900.)