John Thomas Arlidge (1822-99) and the Potteries¹

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'His clinical description of the disease (silicosis) has never been excelled.' (Meiklejohn, 1946)

Thackrah opened his *The Effects of Arts, Trades and Professions* (1831) with the words 'Man in his several relations is assuredly the most interesting subject for examination and reflection'. J. T. Arlidge warrants both examination and reflection because, in contrast to Thackrah, he has not yet taken his deserved place in the history of medicine. Thackrah found his first biographer only one year after his untimely death (Whytehead, 1834); his treatise ran into several editions on both sides of the Atlantic and was reprinted in 1957 with a splendid introduction by Meiklejohn. Arlidge, after a short flash of publicity and glory following the publication of his Milroy Lectures (Arlidge, 1889) and subsequently of his magnum opus *The Hygiene, Diseases and Mortality of Occupations* in 1892, fell into almost complete oblivion until Meiklejohn resurrected him in many of his papers (1946, 1954, 1963, 1966, 1969). Isaacson published a short monograph on Arlidge's life and work in 1956 which has never been reprinted and most textbooks on occupational medicine do not mention it. Hunter's (1970) latest edition of *The Diseases of Occupations* favours Thackrah with 200 lines whereas Arlidge has to be content with three and a half, a difference which even Arlidge, keen but immensely cautious in interpreting statistics, would have found highly but undeservingly significant. He would have been pleased, however, that the Section of Occupational Health of the North Staffordshire Medical Institute carries his name and that Andrew Meiklejohn was its first president.

His life

Arlidge was born in Chatham, Kent, the son of a doctor, and became apprenticed to a local apothecary.

¹Based on an address given to the Thackrah Club in Stoke-on-Trent, November 1971.

He proceeded to King's College, London where he collected numerous prizes including the Linneus Medal for Botany, a subject on which he wrote and lectured widely until the end of his life, rarely omitting the problems of ecology and conservation of wildlife which in our day have become of supreme importance. In his presidential lecture to the Staffordshire Field Society in 1887 he deplored the

J. T. Arlidge. From a photograph taken in about 1897 by G. Harrison of Newcastle under Lyme.

'wanton destruction . . . and the perpetual havoc among plants and animals by the senseless and greedy, not always excepting even naturalists' (North Staffordshire Field Club, 1916).

In 1847 he qualified B.A. and M.B. at the University of London and became a Member of the Royal College of Physicians the following year. He obtained his M.D. in 1867 and was elected F.R.C.P. in 1869.

Even those who have now accepted Arlidge as an outstanding pioneer in the field of occupational medicine are often unaware of his merits in improving the gruesome nineteenth century management of the mentally ill. He was a pupil of none less than John Connolly (1794-1866), whose efforts to humanize the treatment of the insane culminated in his famous treatise *On the Construction and Government of Lunatic Asylums* (1847). As Resident Superintendent of St. Luke's Hospital in London, Arlidge followed in the foot-steps of his teacher and dispensed with physical restraints. His own treatise, *'On the State of Lunacy and the Legal Provision for the Insane'* (1859), dedicated to the Earl of Shaftesbury, Chairman of the Commission on Lunacy, contains many ideas and recommendations whose recognition had to wait for more than 100 years. To quote only two: 'every case of insanity is improvable up to a certain point, and 'security does not require gloom and frightful apparatus'. He considered 'a commanding stature, a fierce look, a loud voice and a stern manner' as positive disqualifications for an asylum's medical superintendent.

After the customary grand tour of the continent, Egypt, and the Holy Land, which helped to improve his considerable knowledge of ancient and modern languages, he married Eliza Watt and practised for a few years in Kensington, lecturing at the same time on anatomy, psychology, and medicine at the Grosvenor Place School of Medicine.

In 1862 he made an astonishing and, for the history of industrial medicine, highly important decision: he declined the offer of a chair of medicine at Melbourne and accepted a post as physician to the North Staffordshire Infirmary, Stoke-on-Trent.

At this time Stoke-on-Trent was a loose conglomeration of six small townships (not five, as Arnold Bennett wants us to believe), most of whose 100 000 residents earned their living in coal mines and on the 'pot banks'. The main historian of the Potteries at an earlier period (Shaw, 1829) saw it idealistically as 'the abode of social comforts to multitudes, with commodious manufactories, elegant mansions and comfortable habitations for a busy and enterprising community . . .' but had to admit that on murky days, which coincided with kiln firing, the crossing of the narrow streets led to constant collisions between man and beast.

Another Shaw, however, who called himself an 'Old Potter' (1903), describing conditions of his childhood in the mid-nineteenth century, wrote that the commodious manufactories looked more 'like a stampede of cottages stopped in their march' in which 5 000 boys and girls below the age of 15 years (including 700 between 5 and 10 years) worked for 12 to 16 hours per day.

In the year of Arlidge's arrival, the Rev. Sir Lovelace Stamer, Rector of Stoke, declared: 'I do not think that the employment of young children in the day materially interferes with the power of learning during the hours of school, i.e., 7 p.m.-8.30 p.m. I have never been struck with any appearance of exhaustion from overwork' (Meiklejohn, 1954, p. 31).

Arlidge wisely chose the salubrious environment of Trentham and of Newcastle-under-Lyme for his residence and rooms and took a prominent part in moving the Infirmary from what used to be the verdant valley of Etruria, which was becoming defoliated by the fumes of the Earl of Granville's New Iron Works and the Stoke Gas Company and crowded by Messrs. Wedgwood's tied cottages, to the slightly less polluted heights of Hartshill.

The domineering figure at the new Infirmary was the surgeon, W. D. Spanton, the favourite of the local gentry and of the nouveaux riches. In his autobiography Spanton (1920) made complimentary noises as to Arlidge's clinical acumen, but he also wrote: 'He made an unfortunate beginning of his career as a practitioner by compiling statistics of the people working in the Potteries which gravely reflected on the humanity of the various manufacturers, and not long afterwards was instrumental in the appointment of factory surgeons for earthenware and china manufacturers . . . Not only the manufacturers (upon whom this entailed much expense), but also his medical friends . . . were against him, and up to his death this feeling never entirely died out'.

The 'unfortunate beginning' of this career started with Arlidge's evidence to the Children's Employment Commission (1863) only one year after he came to the Potteries:

'The potters as a class, both men and women—represent a degenerated population both physically and morally. They are as a rule stunted in growth, ill shaped and frequently ill-formed in the chest. They are certainly short-lived; they are phlegmatic and bloodless . . . of all diseases they are especially prone to chest disease, to pneumonia, phthisis, bronchitis, and asthma. One form would appear peculiar to them, that which is known as potter's asthma or potter's consumption.

'That the "degenerescence" of the population of this district is not even greater than it is, is due to the constant recruiting from the adjacent country,

and to intermarriages with more healthy races.'

Thus, like Thackrah, Arlidge did not escape the fate of ostracism—Thackrah because of his illegitimate offspring, Arlidge for what was considered to be illegitimate interference with deplorable factory conditions which he had ample opportunity to observe as a certifying factory surgeon for Stoke, Longton, and Fenton.

In 1868 Arlidge became the first President of the Association of Certifying Medical Officers of Great Britain and Ireland, and in 1886-87 he presided over the North Staffordshire Field Club, to whose members he lectured on subjects ranging from 'The Life of Plants' to the 'Physical Geography and Climatology of Canada'. It is a tantalizing but unfortunately unanswerable question whether he took part in the Society's meeting on 20 February 1896 when, only six weeks after the news of Röntgen's discovery had reached England, 'Lantern slides of Professor Röntgen's new photography by means of the rays from a Crookes radiant-matter tube were exhibited' (North Staffordshire Field Club, 1916).

Whether the lurid description of the mores in the Potteries, about 50 years earlier, by 'the Old Potter' (Shaw, 1903) when young women 'emerged in the mornings from the pottery cellars with torn clothes, woebegone faces . . . after nights of revel, lust, drink and beastliness' reflected the true state of affairs in this citadel of Wesleyan morality is a matter of contention (McKendrick, 1971). However, Arlidge saw room for improvement as is obvious from his lectures to the potters of Burslem in 1886, from which only a few gems can be quoted (Isaacson, 1956):

'you cannot drown your stomach in beer without paying for it in your lungs . . .'; or 'Ladies fail to give thoughts to undergarments, many a cold is got from failure to do so . . .'; or, best of all his advice to courting young men not to be deceived by smart bonnets or by slender stay-bound waists: 'Steal a glance at the boots and hold no further communion with the wearer of a dilapidated downtrodden pair. Make an unexpected morning visit to the fair one and let a slovenly, dirty or torn dress operate upon the ardour of your rising affection like a cold douche . . .'

In politics Arlidge supported Disraeli and in 1878 he was elected mayor of Newcastle-under-Lyme. His term of office seems to have been uneventful. On retiring he had little more to report than that a new church wall had been built for Sir Gilbert Scott's Parish Church and, using a doubtful metaphor, that 'the sewage question was still a thorn in the side of the Corporation'. He thought little of the future of electricity for street lighting and reassured his councillors that 'a small population and the absence of manufactures were not inimical to progress,

prosperity and health' (*Staffordshire Times*, 1879).

Arlidge died after a long and painful illness in October 1899.

The Hygiene, Diseases and Mortality of Occupations

Arlidge dedicated his book to Sir Andrew Clark P.R.C.P. (1826-93), who had encouraged him to enlarge his two Milroy Lectures into a treatise. This treatise eventually became a book of 570 pages. Strangely enough, when Sir Andrew's widely acclaimed work on fibroid diseases of the lungs (Clark, Hadley, and Chaplin, 1894) appeared one year after his death, Arlidge is not mentioned among the names of many eminent physicians and pathologists, although at that time he had given by far the most comprehensive account of the pathological basis and clinical manifestations of dust-induced fibroid disease.

Within the limits of this paper it is impossible to discuss more than one or two aspects of Arlidge's work. *The Hygiene, Diseases and Mortality of Occupations*, making allowances for technological progress and the profound environmental changes caused by the industrial revolution which Thackrah witnessed in its youth and Arlidge at its height, ranks equally with Ramazzini's (1700) and Thackrah's (1831) work. To strengthen this contention I have chosen a few passages concerned with statistics and chest disease in the pottery industry.

Statistics

Arlidge had the advantage denied to Thackrah of having two Decennial Reports of Occupational Mortality at hand (Farr, 1875; Ogle, 1885). He treated them with respect but discernment. Some of his comments and criticisms are as valid today as they were in 1892: ' . . . the loose definitions of employment to be found in mortality registers detract considerably from the value based upon them'; or 'One trade may produce a large amount of feeble health, and may spare life many years; whereas another will be attended by severe illness and shorter life . . . and will exhibit a higher rate of mortality'. He fully agrees with Ogle's shrewd observation on the 'disturbing influence on mortality tables' by self selection: 'those employments that require the greatest strength, are such as naturally exclude the weaker members of the community' and with apparent gusto quotes Sir Arthur Newsholme's (1889) sarcastic comment on the value of mean age at death: 'It would be absurd . . . to draw any inference from a comparison of the mean ages at death of bishops and curates.'

His intimate knowledge of pottery manufacture provided Arlidge with ample examples of potential

statistical pitfalls: 'the decorative department of the pottery manufacture differs, *toto caelo*, from that concerned in the making of the ware', and in another place: 'the word potter is of a very elastic character and may be extended to mean any workman employed in pottery. . . . Even were it a fact that the returns exclude nearly all artisans in the finishing departments there still would remain a very large section of workers engaged in employments very diverse in health conditions, to whom calculated statistics would not correctly apply.'

The modern epidemiologist still plagued by the same problems could hardly express them better than in Arlidge's words: 'Of a considerable percentage of death the cause is not registered; and an equal proportion are assigned to causes ambiguous and even ridiculous. . . . The returns are also greatly influenced by the prevailing pathology and phraseology of the day. In former years, sudden death was constantly attributed to apoplexy; it is now as commonly put down on heart disease'; or 'Another common incident when the health-fulness of an occupation is called in question, is to direct attention to some old operatives, found here and there—as a triumphant vindication of its sanitary character. It is forgotten that the continued existence of such ancient workers witnesses to nothing else than their superior vitality, and that the large number coeval with them have vanished'.

Throughout the length of his book Arlidge admonishes his readers not to ascribe disease to 'incidental' factors when they could well be due to 'accidental' ones. In modern parlance he asks them to differentiate between general environmental and specific occupational causes. Alas in some instances he has to admit, like many before and after him, that this distinction cannot be made, which is some consolation to those of us who have tackled the question of industrial chronic pulmonary disease.

Chest disease in the pottery industry

Arlidge opens his general remarks on the inhalation of dusts with the blunt statement: 'few are indeed the occupations in which dust is not given off. In none can it be absolutely harmless'. Without reservations he classifies pottery manufacture with those industries 'wherein employment is distinctly chargeable with the production of the disease. The principal material to which its unenviable character is due are the clays and flint used in it'.

There follows a precise description of the multitude of diverse operations in pottery manufacture, diverse in terms of both work and risks, which convincingly proves that Arlidge was not an arm-chair philosopher but must have watched the potter at his work many times. Arlidge's description of

potter's silicosis deserves quoting almost in its entirety:

'The pulmonary mischief from the dust of potters clay is slow but sure in its occurrence. The siliceous character of the clay lends it more potency for harm than almost any other dust. . . . It is much more irritant than coal dust, and stands on a par with the worst kinds of stone dust. . . . When uncomplicated by tubercles the potters disease advances imperceptibly. . . . Haemoptysis does not usher in the malady, and more frequently than not never makes its appearances . . . there is no febrile reaction, no accelerated pulse, no hectic, and no rapid emaciation. . . . The cough is more paroxysmal and violent than that of phthisis, and the urgency of dyspnoea greater, and out of proportion to the ascertained extent of consolidated lung. The signs of condensation are not so specially limited to the infraclavicular spaces as in tuberculous lesions. . . . Areas of dullness on percussion are often distributed at different parts . . . between these an emphysematous condition is discoverable. . . . Ulceration of the vocal cords and aphonia are wanting.

'As might be foreseen from the increased strain on the pulmonary circulation, the heart gets frequently involved, the right side becomes dilated and the valves inefficient. Hence anasarca in prolonged cases is no infrequent occurrence before the scene closes . . . the general aspect and physiognomy differ from those of tubercular phthisis—the lustrous eye, the often pink and transparent skin of phthisis, the clubbed finger-ends, and the incurved nails are wanting. But in looking for these distinctive signs we must never forget how frequently tubercular deposit modifies the picture of fibrosis I have endeavoured to present.' Meiklejohn's (1946) dictum that Arlidge's clinical description of silicosis 'has never been excelled' seems well deserved.

With regard to job specific incidence: 'the strongest example of injury to health . . . is found in the case of "china scourers"—always women belonging usually to the rougher more ignorant, and reckless of their sex'. The recklessness seems to us excusable as their morbidity and mortality from silicosis and silicotuberculosis remained at a very high level until the substitution of flint by alumina for china placing in the 1940s (Meiklejohn, 1963; Meiklejohn and Posner, 1957; Posner and Kennedy, 1967).

One of the most interesting of Arlidge's statements is that: 'The fictile compound forming the "body" of china articles is more prejudicial than an earthenware body.' Because of the absence of flint from the bone china body, workers in the clay departments of the china industry have always been and still are excluded from the statutory initial and periodical examinations (The Pottery (Silicosis) Regulations, 1932) although mass radiography investigations have revealed a high prevalence of pneumoconiosis

in certain china workers, such as throwers, turners, and casters (Posner, 1963).

With regard to prevention, Arlidge praises the master potters for the introduction of ventilating fans but regrets that they have not been universally adopted, 'the explanation of which fact is to be found in the absence in many factories of steam power to drive the fans' (Arlidge, 1892, p. 311). In this connection it must be mentioned that a Watts 'Sun and Planet' steam engine had been driving Wedgwood's flint and colour mills for more than 100 years (Schofield, 1963) and that in Arlidge's time all the major factories and flintmills in the Potteries were not short of steam power. Arlidge minced no words about the 'astonishing indifference' of the potters with regard to their hazards and complains that 'plans introduced from time to time to amend their conditions of labour have often been frustrated by negligence and wilfulness' (Arlidge, 1892, p. 312).

However, it must be recorded that naturally many passages in Arlidge's *The Hygiene, Diseases, and Mortality of Occupations* have not withstood the test of time. For example: 'from special enquiries I have made, it would appear that the numerous hands employed around Aberdeen in the cutting, dressing and polishing of granite are seldom victims of pulmonary lesions attributable to their occupation.'

One of my predecessors (Rose, 1971), as a lecturer to the Thackrah Club, has said that Thackrah, Kay, Baker, and others should not be regarded as 'eminent Victorians . . . but as radical crusading young men who often had to take hard knocks'. As has been shown, in his early days in the Potteries Arlidge shared their fate but he died a much respected physician and politician in the best Victorian tradition.

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