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Historical Perspective

Cape Asbestos, Barking, Health and Environment: 1928–1946

Morris Greenberg, MB, FRCP, FFOM (RCP)*

Background *The mining of chrysotile began in the province of Quebec in the late 1870s. Twenty years later, while annual exports were still measured in hundreds of tonnes, serious and lethal effects were being reported in England and shortly after in France. In 1913, after a number of years of operating in South Africa, Cape Asbestos Company established a factory in Britain in Barking, Essex. Some 15 years later, in 1929, the local Medical Officer of Health was seeing their asbestotic workers at his Chest Clinic, the local Chest Hospital was investigating them and publishing their findings, and the Coroner began what was to be a long series of inquests.*

Methods *Documents from the Institute of Mining and Metallurgy, The Royal School of Mines, Central Library of Imperial College, The Porton and Barking Archives, and documents obtained by legal discovery were utilized in preparing this historical perspective.*

Results *Despite complaints from the local authority, Parliament was assured that there was no special incidence of disease at Cape, Barking, and that its exhaust ventilation was quite up to the general standard and constantly being improved. Reports on the factory environment and information on the health of Cape's workforce that are available for the years 1928–1934, provide a less sanguine view of the situation, as was confirmed by subsequent health reports on its workforce.*

Conclusions *The case of asbestos is considered as a paradigm for the economic considerations that are considered to justify the perpetuation of unsafe and unhealthy occupations, decisions with which medical opinion can be found to concur.* Am. J. Ind. Med. 43:109–119, 2003. © *2003 Wiley-Liss, Inc.*

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INTRODUCTION

Cape Asbestos began to manufacture asbestos products at Barking, East Ham in 1913: it was not by accident that Boroughs to the east of London came to house hazardous and noxious processes. In the latter part of the 19th century, these enterprising local authorities would advertise in continental newspapers, alerting manufacturers to the advantages of setting up locally: these included a plentiful labor supply, cheap local authority housing, and, as a special inducement, freedom from the restrictions of the London County Council outside whose administrative boundary they were situated. As a consequence, they succeeded in attracting toxic and "sweating" industries, yielding an unenviable legacy of human and environmental blight to be enjoyed by succeeding generations.

Cape did not come new to the field of asbestos when it set up in Barking, but had the benefit of experience derived

Extramural, United Kingdom
Contract grant sponsor: The Joseph Rowntree Charitable Trust.
*Correspondence to: Morris Greenberg, 74, North End Road, London, NW11 7SY, UK. E-mail: GillMorris.Greenberg@btinternet.com

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from its earlier activities in South Africa. Further, while manufacture of asbestos products had begun in the UK since about 1880, and annual imports of raw material were still measurable in hundreds of tonnes, its severe adverse health effects on the workforce were not long in being reported there [Deane, 1899; Murray, 1907], in France [Auribault, 1907], and in Italy [Scarpa, 1908]. No useful lessons would seem to have been learnt by Cape, or if learnt put to good effect. From the inception of the UK asbestos industry to the first reporting of disease took 18 years (1880–1898); from the start up of Cape to the reporting of disease in its workforce took 15 years.

Cape was not operating in a vacuum even in the days before the trade associations were established. For example, it was in regular contact with Turner Brothers Asbestos Company (TBA) of Rochdale, at Trade Meetings and by correspondence, sharing health reports and experience. On the 8 April 1932 the Company Secretary of Cape wrote to W.W.F. Shepherd, one of the directors of TBA, discussing the vexed problem of perceived misdiagnoses at death by asbestosis, in workers who happen to have had pulmonary tuberculosis, and whom he considered did not have asbestosis at all. He felt that this ought to be taken up formally with the Home Office. Shortly after, on 2 June 1932, R. H. Turner, another director of TBA, sent Cape a copy of a report by a Dr. Pooley[1] which Cape, not surprisingly, did not consider very helpful, as it consisted of 48 lines of typescript, only 11 of which dealt with asbestosis; nevertheless they asked if they might be informed of any further information that came to hand at Turner and Newall Asbestos (T & N).

With the publications arising from studies of their workforce, and the American Courts throwing open the archives of T & N, [Chase, 1990], their apologists have maintained that the company has been victimized as a result of its superior record keeping and openness, implying that it was no worse than other asbestos companies and better than many. While such pleas are no excuse for acts of omission, records available for Cape Asbestos were reviewed to see how it dealt with its responsibilities towards its workforce.

THE MEDICAL OFFICER OF HEALTH FOR BARKING URBAN DISTRICT COUNCIL (UDC) REPORTS

In minutes of Barking UDC for the period 1927–1928 (Page 72), approval was noted for the appointment of Dr. C.L. Williams as their Medical Officer of Health (MOH), who seems to have wasted no time in writing in his first annual report for 1928 to the Council, under the heading of 'Asbestosis:'

> "During the year, my work at the Chest Clinic[2] has drawn my attention to a particular disease which while resembling consumption in many ways, is not due, I feel sure, to the germs of Tuberculosis, that is consumption.[3]
>
> As Medical Officer of Health, the possible association of this disease with industrial life has had my attention, and certain steps have been taken in the matter. I am hopeful that our experience in Barking when correlated with that in other similar towns may help clear up a somewhat difficult and serious problem."

In the general introduction to his 1929 report to Council he noted:

> "... I have had the greatest help from my colleague Dr. Burton Wood and also from Dr. Gloyne,who is a pathologist at the Victoria Park Chest Hospital,[4] and we have established that many people in Barking are suffering from the disease of the lungs due to the inhalation of asbestos dust.
>
> Somewhat late, the Home Office on the 17th March, 1930, issued a memorandum on the subject, after you, on the finding of our personal experience, had made representations to them."

Williams devoted three pages of the main text of the 1929 report to the subject of asbestosis, which included the following:

> "In June 1929 an interim report was circulated to members of the Council at the request of the Juvenile Employment Sub-Committee. In this interim report a table was given, showing that of nineteen cases of persons suffering from some pulmonary disability and who had been exposed to asbestos dust, there was sufficient evidence to warrant a diagnosis of asbestosis in eight, no sufficient evidence to warrant a then diagnosis in nine, whilst there were two cases at the time in question awaiting further examination."

The same report included five conclusions that in William's opinion had been established up to that time:

1. "That people working in asbestos factories inhale asbestos dust, which can be found in the substance of the lung proper and in the sputum which is exuded from the bronchi of the lung.
2. That the presence of this asbestos dust in the lungs produces a definite disability, adversely affecting earning capacity and decreasing the expectation of life.

3. That it is possible for an exposure to asbestos dust over a period of six months to produce a definite disability lasting over many years.
4. That there is not sufficient evidence to warrant an opinion on the question of the possible increased incidence of tuberculosis in persons who are suffering from asbestosis.
5. That these conclusions indicate that the conditions under which certain of these cases have been working have been such as to permit the inhalation of asbestos dust, with consequent pulmonary disability."

He concluded with the observations:

"... we have at the end of the year 23 cases investigated, 9 of which show sufficient evidence to warrant a diagnosis of asbestosis, 10 of which showed no sufficient evidence at that time to warrant a diagnosis of asbestosis, and 4 of which were waiting further investigation.

... During the year 1929 there have been three deaths in Barking attributed to asbestosis ... Another case of asbestosis died during 1929, and the cause of death was given as 'Bronchitis.' Of course this notification is quite correct, but in my opinion it does not represent the whole truth."

In his 1930 report to Council, Williams expressed high hopes for the asbestos regulations stating:

"The passing of the Workmen's Compensation (Silicosis and Asbestosis) Act, 1930, should in time do much to mitigate the lung trouble from which many persons in Barking suffer, and which is provoked by the inhalation of asbestos dust. It will, however, take many years for any substantial improvement to be felt. It is not unreasonable to suppose that for the next fifteen years we shall be getting deaths from asbestosis among people whose lungs are already affected."[5]

In 1931, Williams restricted himself to reiterating his opinion that insufficient time had elapsed for the 1930 Act to make itself seriously felt, and in succeeding years his reports were silent on the subject of asbestosis, and he observed:[6]

"The work I have been carrying on in this connection [in relation to asbestosis] convinces me more than ever we shall never get an efficient complete medical service in England until the whole of the public medical services are united under one Ministry. The fact that the health of workers in the factories is under one Ministry and the health of these same workers outside the factories is under another Ministry is essentially bad."

By that year a total of 57 cases of asbestosis were reported as having been diagnosed at the Victoria Park Hospital, 12 complicated by pulmonary tuberculosis (2 quiescent and 10 active) [Wood and Gloyne, 1931].

A study of the minutes of Barking UDC and its various committees over the years 1927–1936 threw up no further references to asbestos, other than a request from Cape Asbestos for permission to use asbestos cement soil pipes,[7] to which they responded: "We recommend that this type of pipe be not approved."

LOCAL GOVERNMENT, CENTRAL GOVERNMENT, AND CAPE ASBESTOS

Apart from the implied criticism in their comment of how late the Home Office asbestos memorandum had been issued, official reports of the Council provide no evidence of friction between a Council alarmed by its perception of the severity of the asbestos problem, and the official sanguine attitude of the Factory Department of the Home Office, as characterized by their Minister's assurance to Parliament.

The London Borough of Barking and Dagenham archives do not contain either Dr. Williams' or the Council's or its sub-committees' papers and correspondence (personal communication Heritage Services Manager), however, some unpublished papers relating to Cape Asbestos, Barking, at that period have survived, providing evidence that all was not sweetness and light between Barking UDC and the Factory Department over Cape.

In 1928, The Factory Department in the persons of Dr. E.R.A. Merewether, H.M. Medical Inspector of Factories and Mr. C.W.Price, H.M. Inspector of Factories, started clinical and environmental studies of the asbestos industry. In 1929 their seniors tried to speed up the reporting of their conclusions from the study, in response to Barking's alarm about the health of Cape workers. The Education Committee on Barking Town Council, which included in its concern obtaining employment suitable for young persons, had passed a resolution on the Employment of Juveniles, and was proposing to send a deputation to wait on the Secretary of State. The MOH alerted the Home Office to the sequence of inquests that had taken place on Cape workers, and Price was recalled from Christmas leave to accompany a Medical Inspector to an inquest on 23 December 1929.

Williams met and discussed his Cape Asbestosis data at length with Merewether, who reported to the Senior Medical Inspector:

> "... the impression I gained during this long interview. This impression is that he is obsessed with the subject especially from the compensation point of view—perhaps because of pressure from his Labour Council."

However, there is no mention of compensation in Williams' annual report for 1930 in which he informed the Council:

> "We still continue to keep the dossiers of these patients up to date, in order intensively to study the progress of the diseases, with the object of finding out everything possible. It will readily be recognized that it can only be by finding out everything possible that we can hope to build securely a scheme for preventing the future incidence of asbestosis."

In the event, Williams appears to have discontinued surveillance of asbestosis in East Ham, which was anyway the remit of HM Factory Inspectorate. His MOH responsibilities were onerous, as he was responsible for an overall population of 47,620 with pressing problems, including: maternal and infant health; the health of schoolchildren; running a diagnostic and treatment clinic for tuberculosis; and the diagnosis, treatment, and control of infectious diseases. With the district having attracted a young population from the East End of London, the MOH would have been fully occupied with their immediate care and in planning for the demands of a population increasing by 7%/year.

In contrast to those physicians who successively were persuaded that the measures adopted by the asbestos industry would virtually eradicate disease [Murray, 1907;[8] Lanza, 1939;[9] Wyers, 1946[10]], Williams concluded that the 1931 regulations would only mitigate the health problem, and that it would be many years before improvement would be seen.

In 1930, he could list 27 cases that he had investigated for asbestosis, of which sufficient evidence was found to warrant a diagnosis of asbestosis in 12 cases, with further examination awaited in 5 cases. This occupational health problem, serious as it was, has to be seen in the context of his priorities for Barking's other public health problems. In that year, while four persons were certified as having died of asbestosis, among 486 hospital admissions for infectious diseases, 17 died from diphtheria and scarlet fever, and there were 36 deaths on his Tuberculosis Register of 737 cases [Registrar General, 1931].

Although Williams made no further comments on the subject of asbestosis in his reports for a number of years, he continued to assist the Victoria Park Hospital with their investigation of the diseases of asbestos workers and his contributions were duly acknowledged by Wood and Gloyne in their publications. After Williams ceased to tabulate deaths at Cape, the Factory Inspectorate proved very attentive to mortality at the factory for several years (Table I).

THE FACTORY INSPECTORATE AND CAPE

A question had been put to the Home Secretary on 12 December 1929, asking him whether he was aware of yet another inquest on an employee of an asbestos factory at Barking who had died of asbestos poisoning and whether he was aware that asbestosis is prevalent especially at Barking? The reply prepared for him concluded with the reassuring statement[12] that:

> "... the investigation did not disclose any special incidence of the disease at the Barking works, where the exhaust ventilation (which is

TABLE I. From a Manuscript Entitled: Fatal Cases of Asbestosis at Cape Asbestos Co. Barking Which Have Come to the Knowledge of the Factory Department

No.	Date of death	Name[a]	Sex	Age	Occupation	Duration of employment (years)	Interval between cessation of employment & death	
1	30.11.29	WH	M	47	Weaver	14	1 year 6 months	Ceased work May 1928
2	19.12.29	BS	F	22[b]	Spinner	14		
3	30.12.29	MP	F	50	Asbestos worker	19	3 years	Ceased work in 1926
4	27.6.30	ES	F	37	Spinner	$12\frac{1}{2}$	$3\frac{8}{12}$ years	Ceased work in Nov. 1926
5	11.10.30	FB	F	30	Mattress maker	$6\frac{10}{12}$	$6\frac{3}{4}$ years	Ceased work Nov. 1929
6	13.10.30	SF	M	42	High pressure jointing Dept	$9\frac{5}{12}$	$\frac{11}{12}$	Ceased work Nov. 1929
7	2.2.31	EL	F	31	Mattress maker	$4\frac{5}{12}$	8 years	Ceased work on 2 Feb. 1923
8	4.2.31	ES	F	46	Spinning room	15	2 years	Ceased work Jan. 1929

[a]Anonymized by author.
[b]Probably a clerical error for 32 (internal evidence and checking against Dr. Williams' notes.).

the chief means of prevention) is quite up to the general standard and is constantly being improved."

This may have been based in part on a visit some three months previously (15 August 1929) by the Manager of Cape Asbestos, Barking to Dr. Middleton (a distinguished Medical Inspector, and an expert in the pneumoconiosis), who informed him of proposals for localized ventilation for some of the machinery including opening, spinning and weaving, as well as innovation to reduce the dustiness of bagging asbestos. The reassuring ministerial reply was quite at variance with the evidence. The Factory Inspectorate and others were to pay a lot of attention to Cape over the next few years, and to find it seriously wanting.

The order of Cape's problem can be inferred from a dust count survey carried out on 23 September 1930 which revealed an unsatisfactory situation (Table II). A weaver under best conditions was exposed to 406 particles/c.c. which in terms of particles per cubic foot is several orders greater than those were to be reported for miners studied by McDonald et al. [1980], and for weavers studied by Dreesen et al. [1938].

Merewether, after he completed his studies at asbestos factories in Lancashire and in London, returned to his office in Glasgow, but continued to take an interest in Cape. On 23 October 1930, he wrote to Mr. Field in the Home Office, referring to two named Cape employees, and asking whether either had since died: he also inquired whether there was any further information on three other Cape cases. The letter was passed to Middleton who replied that he only had information on one of the cases (Table I, No. 6) and enclosed a copy of a report on the inquest held, and drawing his attention to the work history of the deceased:

"... the only constantly heavy exposure occurred 9 years ago, namely, 4 months in the fiberizing department. Probably his trouble was determined there and then, and subsequently the dust from the cards, about 10 yards from which he worked, would aggravate his condition ..."

On 25 February 1931, Mr. H.J.Muggeridge, a Labour-Member of Parliament, wrote to a Labour Home Secretary:

"Dear Clynes,

Referring to your letter of the 19th, I am sorry to trouble you again, but the matter of this Barking factory is so urgent that I want to put a few more facts that have come to my knowledge before you, rather than ask a question in the House.

I am assured by a very credible witness, that special preparations are made, when your Inspectors go to the factory, to conceal from them some of the worst features of the dust evil from which so many of the employees suffer. I am told, for instance, that, as soon as the office there knows that your Inspectors are coming instructions are given to stop the machines so as to lay the dust, and three men, with the aid of a vacuum cleaner, are put to the work of removing all the signs of it from the girders and principals in the machine shop.

The firm informed your representatives that they spent £2,000 on a dust removing plant. But this is only in one section of the building. There is, for example, a carding department where many girls are employed, where the dust is even worse than in the actual machine room, but where no dust-removing plant has been installed.

Mouthpieces are issued to the girls and other employees but I have seen one of these, and it consists only of a piece of calico, with two pieces of tape for tying round the head. So far as I can see, it would make breathing after a time practically impossible, would not act as a filter, and

TABLE II. Copy of Typescript [0000 0351 0881]

Asbestos Committee

Dust counts at Cape Asbestos Coy. 23/9/30

Emptying chamber
712 particles/c.c
575 particles/c.c
1,448 particles/c.c. = sweepings
Average = 912 particles/c.c
Burst of dust through sack as shovelful of asbestos was dropped in
2,356 particles/c.c
Cardroom: Breathing level of Card Tenter (condenser)
563 particles/c.c
Weaving cloth: exhaust off
1,057 particles/c.c
Weaving cloth: exhaust on: same loom as No. 4
406 particles/c.c
Spinning: record not identified with 50 c.c. sample

McDonald et al. [1980] approximated 6.6 millions of particles/cubic foot to 20 fibres/c.c. While the conversion from cubic foot to c.c is simple, deriving the equivalent of particles per c.c. to fibres per c.c. has not been attempted as it is fraught with considerable uncertainties arising from different environments, different sampling strategies, and methods of measurement.

in the case of girls whose lungs have already been affected (some times only half left) it is impossible for them to use it.

Furthermore, the company even now has several employees away, affected by asbestosis, and pays them no part of their wages. One man named [deleted], who has been in their employ for 7 or 8 years, and has, when specially requested, worked late in the unhealthy atmosphere of the factory, has now become so affected that he has been away for 6 months, certified as suffering from the disease, and is getting not a penny from the Company, but is left with his family, to subsist on the sick [illegible].

I am convinced, from all that I am told, that your Inspectors do not know the real facts about this place, and I hope you will send one or two down, with special instructions, and perhaps will allow me to accompany them, to satisfy myself as to the condition of things there.

There have been eight of these painful deaths in the last 14 months, as well as a long list previous to that period, while the health of the whole staff appears to be in a bad state.

Please let me know what can be done to take prompt steps to deal with this firm, which, I am sure, is putting off as long as it can the action your department will want them to take."

This letter was passed to Merewether by the Chief Inspector for his observations which he gave promptly in a memorandum on 3 March. On the matter of the Company preparing for Inspectorate visits, he replied:

"It is true that on special occasions and in order to make the visit an effective one, notice has been given to the firm that a Technical Inspector (Medical or Engineering) proposes to visit. On other occasions visits have been paid without notice, and I can state from my own experience that the time spent in the office would not in any way permit preparations of the character suggested to be made in the Works."

On the subject of Ventilation his comments included:

"In the process of spinning and weaving, this firm has made greater progress in dust removal than any other firm, and the plant which has been installed is most efficient. The exhaust ventilation for the carding machines has been in operation for many years and is not up to modern standards.

I am not clear what is meant by the 'machine room,' but it may refer to the disintegrating and settling plant. At these the exhaust system is in use, and while to some extent efficient and in advance on old methods, it is realized that improved arrangements can be made and these will have to be effected to meet the requirements of the draft regulations . . .

I am afraid I am not by any means satisfied that the general standard of dust suppression is sufficient to prevent cases (of asbestosis) developing. This is not in any way belittling the extensive and continuous efforts the firm has made to suppress dust, but in my opinion, having regard to the very high standard required if new post-regulation cases are to be prevented from occurring."

In response to Muggeridge's note on the mouth guards provided to the girls, he avoided the issue and reported:

"One very satisfactory point was the really excellent use made of the Mark IV respirator[13]."

REGINALD TAGE INVESTIGATES CAPE

An enthusiastic amateur with no mandate, succeeded in insinuating himself into the Cape factory to investigate the diseases of asbestos workers. Signing himself Reginald Cosburn-Tage, he wrote to the Trades Union Congress (TUC) on 23 January 1932 informing them that since 1929, autopsies had been performed on 11 persons who had worked at Cape [Tage, 1932]. Their average length of employment he stated was 8 years, and the average period between starting work and death was 11 years. He reported that the average number of workers in 1930 were 218 and that the total of present and past employees known to be suffering from asbestosis to be 160 [14].

VICTORIA PARK HOSPITAL'S STUDY OF ASBESTOSIS

Because of the strategic position of the Victoria Park Hospital, from the late 1920s onwards Dr. S. Roodhouse Gloyne and Dr. W. Burton Wood were well placed to study and report on asbestos associated diseases at Cape and neighboring asbestos using enterprizes, producing some of the classics of asbestos literature. Their findings would also have been made more widely known from the proceedings of

the local Coroner's Court that were regularly reported in the local newspapers and occasionally in the nationals.

CAPE AND PERSONAL RESPIRATORY PROTECTION

By 1930, there were a number of dust masks in use which filtered air to varying degrees, but they were recognized as being of severely limited value in protection, being intolerable for prolonged use and inefficient against heavy concentrations of fine dusts such as asbestos.[15]

REGINALD TAGE'S MASK

The enterprising Mr. Tage having insinuated himself into the Cape factory in 1930, also established informal associations with the TUC and with its medical advisor Dr. Legge, and with Dr. Gloyne at the Victoria Park Hospital, inter alia informing them of cases of disease at the factory [Wikely, 1992; Greenberg, 1993]. In 1931, among his various initiatives was the design of a mask for asbestos workers, which he did using a framework said to have been made by Siebe Gorman,[16] with a filter he had assembled using cellulose fabric, foolishly testing it out on himself in the dust chamber at the factory. This development was helped by the cooperation of the Assistant Works Manager, who he said had asbestosis, but he thought that the Manager would not give it a fair trial. After providing further valuable and unsolicited service to the TUC, Tage disappeared from the asbestos stage.

Porton

In the period after the end of First World War and before the build up to the Second, the Chemical Defence Experimental Establishment (Porton), while it had not been beaten into a ploughshare, nevertheless responded to requests for assistance with civilian problems including protection against industrial dusts. The physicians on the Medical Research Council's Committee on Industrial Pulmonary Disease notwithstanding, Porton with its engineers, physicists, and physiologists were well equipped for the task, and were to develop several models. Their Mark IV respirator was to be tested at Cape and was used for a number of years widely in industry, until it was appreciated that even when properly fitted and maintained, and tolerated, it was of limited value in exposure to high dust concentrations.

Dr. W.R. Jones' Initiative

On the 29 May 1934, Dr. Middleton wrote to Dr. Bridge, that Dr. W.R. Jones had informed him that an air compressor had been installed at Cape and an apparatus ready to be worn by a man sawing insulation section. This was referred to Mr. C.W. Price, who visited Cape and reported to the Senior Engineering Inspector. He was very approving of the efficiency of the mask and the fresh air supply, reporting that when a pad of cotton wool saturated with eau de cologne was pressed against the wearer's cheeks, the odor could not be detected by him. He was, however, critical of the exhaust ventilation in use which he described as ill applied and inefficient. Improvements should be possible but dissemination of fine dust into the atmosphere he considered almost inevitable.

Price reported Dr. Jones to advocate the widespread use of such masks to all workers subject to even low concentrations of dusts of silica, asbestos etcetera, and remarked that while the advantage to the worker in this particular department was indisputable, he considered that it would be difficult to overcome the inertia of both employers and employed generally, supposing the wearing of such masks were made the rule.

Dr. Jones was sceptical of the value of exhaust ventilation, remarking that even where it is very efficient, drawing air past the worker charges it with fine dust some of which must be inhaled. Price considered that if the masks became relatively "popular," the effect might be to detract from the use of exhaust which he considered an effective safeguard.

Dr. Bridges wrote to the Chief Inspector on 16 July 1934 about the use of fresh air breathing apparatus at Cape, agreeing Price's opinion that masks were no substitute for exhaust ventilation, and asserting that they were more or less impracticable for factory processes. He also mentioned that J.W. Roberts of Armley acting on his suggestion had designed a small facepiece with compressed air supply for the protection of workers spraying asbestos coatings on walls.

On 20 December 1934, Dr. Bridges wrote to the Chief Inspector of Factories about a visit he had made jointly with Dr. Middleton to Cape, in connection with their use of air fed respirators. These had been installed by Siebe Gorman [17] at the suggestion of Dr. W.R. Jones,[18] and had been in use by a certain number of operatives for the past 10 days. Bridges appreciated the benefit if worn constantly, but saw operatives disconnecting the line on several occasions even during his brief visit. The light facemask was preferred to the cumbersome mask, but there were problems of access at some sites due to tethering of the worker by the air line. In his opinion, the Manager was thought to be alive to the limitations of this form of protection and not regarding it as an alternative to dust removal plant. Dust sampling was discussed, and a trial of the Mark III respirator from Porton. Bridges concluded:

> "I would say that the firm have undoubtedly done a great deal of work in the removal of dust. Unfortunately, in carrying out experiments—some of which have been unsuccessful—attention to some details have been overlooked. For

example, an automatic plant designed for making slabs proved unsuccessful and on returning to the old plant the exhaust ventilation had not been connected up again. This, I am glad to say, has now been remedied.

I understand that there is a question of taking proceedings against the firm for certain irregularities, but I would submit that in view of the steps taken by the firm it would be undesirable to take such action. Further, we have received every assistance in testing out the various types of respirators submitted by Porton, and they are willing to carry out future tests."

On the 12 December 1934, Mr. Price and Mr. Lowe conducted a day long inspection of Cape, Barking as instructed by the Chief Inspector and reported on 24 December 1934. They found what they described as a number of somewhat serious irregularities, which they presented in considerable detail, including the following observations in a report for whose length they were apologetic.

Slabs

Slabs were being made by hand with exhaust being provided by crude hoods under which workers often had to stand, although at the time of the visit they wore respirators. Paper lined sacks were placed on the floor but were not exhausted. On further investigation they found that there was no exhaust, as the fan had been disconnected a few weeks previously.

Sawing

A new band saw had been provided with powerful exhaust at several hoods, which, while a distinct improvement on two older saws, still allowed dust to escape near the "breathing" position. The extraction at the older saws was still inadequate and one hood was missing. Efficiency had been reduced by the neglect of the bag filter, which had last been cleaned 3 days ago. Debris had collected within the hoods and on the surrounding floor and plant.

Disintegrators

All disintegrators were hand fed with some workers being stationed within the chambers. At Mr. Lowe's previous visit on 7 December, he found no exhaust operating at the feed opening and that blow outs occurred. This had been remedied by switching to a more powerful motor, but there was leakage of dust from joints of overhead trunking. On the floor, crude material was found in boxes, and waste was in heaps.

The textile departments were said, generally speaking, to be satisfactory, though they found inadequate draught at one site, a hood to be too far away in another, and in front of one large loom, the hood had been removed and not replaced.

Boiler compositions

A fan had been removed from a mixer and moved to a new site with no replacement, giving rise to very dusty conditions. The hood was too high above the weighing machine to be effective, the bag filter was not separated from the workroom, and permeable sacks were in use.

Powder

Exhaust arrangements were crude and makeshift, and a swivelled hood was turned out of the way when feeding material into the hopper. There were accumulations of dust on floors and apparatus. In view of the non-compliance disclosed by their visit, a short report was sent to the Chief Engineering Inspector dealing with the past history of the matter and recommendations as to the action to be taken.[19]

A POSTSCRIPT FROM Dr. WYERS

In keeping with Dr. Williams' prophesy, the statistical chapter [20] of an MD thesis written some 10 years later, shows the number of known deaths at Cape, Barking from asbestosis, alone or complicated by other diseases such as tuberculosis and carcinoma, to have grown to 98 [Wyers, 1946]. The mean age at death was 34.9 years and the average exposure to asbestos had been 7.6 years (range 24.0– 0.75 years) which was not significantly different from Tage's observation in 1932. Three years later the total number of known fatal cases at Cape were given as 115 [Wyers, 1949].

Unlike certain other physicians, he did not make light of asbestosis, noting that the diagnosis was: "... in most cases a warning of dissolution in the not very distant future."

Further, in the course of his thesis he wrote:

"... evidence already accumulated seems to favor a causal connection between asbestosis and pulmonary cancer, and humanitarian motives may decide the public conscience not to wait for scientific proof before insisting on more stringent safeguards against dust inhalation[21]."

Nevertheless he concluded that much as it has been held that the treatment of tuberculosis was financial, in a similar manner this was true for the treatment of pulmonary fibrosis. The management at the time for tuberculosis involved expenditure for providing rest, an equable and clean environment, and a nutritious diet, whereas in the case of asbestosis the grim reaper was not to be bought off. Edward the Seventh

asked of tuberculosis: "If preventable, why not prevented?" In the case of asbestos, Wyers was aware that with the limitations of engineering control, prevention would require its use to be abandoned. This he considered was not an option on two grounds:

1. "No one would suggest the abolition of coal mining or deep sea fishing on account of their dangers, because they are vital to the welfare of the nation."
2. "Indeed, there is scarcely any industry which does not depend to a more or less degree upon asbestos.To take this valuable mineral away from a nation, therefore, would put back that nation's capacity by half a century, a blow which this country, at any rate, could not survive."

This treatment of the problem of asbestos might be seen as a paradigm for how agents and occupations responsible for substantial burdens of disability and death were dealt with at that time. Wyers was writing at a time before complete demobilization, when the rationing of food, clothes and furniture introduced in the Second World War was still in operation, there were shortages of fuel, and a flourishing peace-time economy remained to be restored. Despite an awareness of the awfulness of death from asbestosis and from lung cancers, and of the frequency of these conditions in his factory, he justified the continued use of asbestos on economic grounds, a sentiment with which the physicians examining his thesis, "That legislative measures have proved generally effective in the control of asbestosis," presumably were in sympathy. It was left to a later generation to find the hazard of asbestos unacceptable, and its use dispensible.

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NOTES

1. Dr. J.S. Pooley was the Director of a clinical laboratory in Rochdale, who presumably was commissioned by T & N to produce a report on asbestosis. He sent to Mr. Turner on 24 May 1932 what he described in a covering manuscript letter as:

   "... a short statement of the present situation (pathologically speaking!) in the group of dust diseases. Much has of course been left out, and only the bare facts are given; still I hope it will serve your purpose. Obviously there would be only needless expense in your initiation of private research to cover already known ground."

   This was not the end of negotiations. Dr. Bateman, Turner's medical advisor, arranged for Mr. Turner to accompany him to a meeting at Dr. Pooley's laboratory on 20 May 1932.

2. Williams was not the only Tuberculosis Officer to make a mark in the early years of asbestosis. Dr. Merewether, who was to conduct the first industry survey had been one before joining the Factory Inspectorate, as had Dr. C.L. Sutherland, the first Chief Medical Officer of the Silicosis and Asbestosis Medical Board.

3. Although generally applied to pulmonary tuberculosis, classicist physicians used the term phthisis to include other wasting conditions. Before Koch's discovery, keen observers discriminated between the toxic febrile phthisis of consumption, and that fibroid phthisis associated with the inhalation of dust, as by potters, masons, flint knappers and cutlery grinders.

4. The City of London Hospital for Diseases of the Heart and Lungs, Victoria Park East, had originally been established as a Chest Clinic in the City in the 19th century by Dr. Peacock, a pioneer in the field of occupational dust diseases of the lung. With the help of fellow Quakers, he moved it to Victoria Park in the East End of London, and developed it as a hospital [Greenberg, 1992]. Inhabitants of East and West Ham fell into the City of London Hospital catchment area, where their records contributed to the early knowledge of asbestosis, though some of Cape's workers preserved an allegiance to The London Hospital, and contributed to our early knowledge of mesothelioma in asbestos workers.

5. My attention was drawn by Dr. B. Castleman to a news story that appeared in the Barking Advertiser (Mar. 15, 1947) entitled "The Tragic Toll of Asbestosis." This cited Williams' report for 1945, in which he noted that his 1930 prediction that there would be a lot of deaths from asbestosis for 15 years, was borne out by the bad state of health of Cape workers in 1945. He further commented: "I am not in a position to assess the essential necessity of asbestos and its products to our national economy, but I am firmly of the opinion that it is a deadly and dangerous commodity and that unless those who are charged with this responsibility of safeguarding the health of the people in the industry can give positive assurances that they have now after all these years removed every possible danger, the processing of asbestos, except in so far as its products are essential to our national economy, should be barred."

6. This opinion was not peculiar to Williams. At an inquest on a worker dying of asbestosis in Leeds, Dr. H. De Carle Woodcock, a "lung specialist" was reported as complaining that he had no opportunity to investigate cases of diseases reported in factories. He was aware that the Factory Department can enter such factories but stressed that local organization should also share responsibility and have power of entry. (Manchester Guardian, March 31st 1928). Today, 70 years later, the position is much the same as in Williams' and Woodcock's time.

7. The use of these pipes is not specified, but the descriptor "soil," a euphemism for human excrement, is suggestive. The reason for rejection of asbestos cement pipes for this purpose is not given, but conceivably might have been based on uncertainty as to its technical qualities as compared with those of cast iron and glazed earthenware.

8. Murray, on questioning about his case report, stated that with the subsequent improvements made by manufacturers, it is unlikely that many more cases would be seen [Murray, 1907].

9. After a study of workers, he claimed that asbestosis was clinically milder than silicosis and that there had been no fatalities [Lanza et al., 1935], and subsequently considered that with the dust control vigorously carried out by manufacturing companies, there may be little opportunity for clinicians to become familiar with asbestosis [Lanza, 1939].

10. In 1946, Wyers successfully defended his MD thesis entitled: "That legislative measures have proved generally effective in the control of Asbestosis."

11. A copy of the reply given was shown to Merewether, who merely acknowledged a sight of it. Whatever reservations he might have had, suggesting a correction to a Ministerial reply already given to a Parliamentary Question is not to be contemplated lightly.

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13. Reference to the use of the Mark IV respirator in 1931 seems anachronistic, as late as 20 December 1934, the Senior Medical Inspector Dr. J.C. Bridges in correspondence with the Chief Inspector relating to Cape's use of respiratory protection devices, refers to the Manager being asked to try out Mark III respirators when received from Porton.

14. There is no evidence of where he obtained these data, but when compared with Wyers [1946] they appear plausible.

15. This opinion was given at the inquest on a worker dying of asbestosis in Leeds by Dr. H. De Carle Woodcock (see footnote 3).

16. There is no record other than Tage's reported assertions, either in Siebe Gorman's archives or at the Patent Office.

17. Messers Siebe, Gorman and Company were active in the design and manufacture of respiratory protection equipment. As a result of being bombed out twice during World War II, and moving to South Wales, they have no records of their collaborative work with Dr. W.R. Jones (personal communication Mr. S. Jones).

18. Dr. W.R. Jones, Reader of Mining Geology at Imperial College, London, while claiming no originality, had advocated masks for gold miners exposed to silica dust, with the provision of clean air under pressure, either from a compressed-air line or from light compressed-air tanks. There is no record of how he became involved at Cape.

19. It would not be unreasonable to conjecture that this "intended action" might be civil servant-ese for taking proceedings against the firm: it may have been this action that Dr. Bridges' advised against in his letter of 20 December to the Chief Inspector. In common with the other major manufacturers, for all the harvests of disability and death at Cape, and the repeated findings of unsatisfactory environmental hygiene conditions up to the moment of closing of the Barking factory in 1968, Cape was to be little troubled by Factory Inspectorate prosecutions.

20. There is no way of ascertaining how comprehensive these data were. Wyers was aware of reasons why they might not have been definitive.

21. Although early in the 1931, asbestos regulations were recognized as being seriously flawed, they were not to be reviewed until 1969. It was not until 1980 that the lung cancer hazard was taken into consideration in determining the hygiene standard.

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