The Parliament of the Commonwealth of Australia

The Effects of Asbestos Mining on the Baryulgil Community

Report of the House of Representatives
Standing Committee on Aboriginal Affairs

October 1984

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Recommendations

The Committee recommends that:

CHAPTER 10 RECOMMENDATIONS AND CONCLUSIONS

1 *That the Attorneys-General of the Commonwealth and New South Wales consider ways and means whereby the technical difficulties presented by Aboriginality in seeking compensation may be removed.*

(Paragraph 10.22)

2 *That the Commonwealth establish an Aboriginal Medical Service based in Grafton to cater for the general health needs of the local Aboriginal communities and having expertise in the diagnosis and management of asbestos-related diseases.*

(Paragraph 10.23)

3 *That the Commonwealth Minister for Aboriginal Affairs recommend to the New South Wales Government that they pass legislation abrogating the lease of Baryulgil Square to the Baryulgil Square Co-operative Limited, and that the New South Wales Government negotiate a new lease for the lives of those persons who decided in 1980 to remain at Baryulgil Square, and that the lease contain a clause by which the land will be forfeit and revest in the Crown if the lessees permit any person not resident at the Square in 1980 to take up residence there or to remain there.*

(Paragraph 10.29)

4 *That the Commonwealth Minister for Aboriginal Affairs recommend to the New South Wales Government that they offer to the people who elected in 1980 to remain at Baryulgil Square a 99 year lease of other land in the Baryulgil area, removed from any risk to health by pollution from the Baryulgil mine site, and that, if and when they accept the offer, the New South Wales Government acquire such land, and negotiate a lease to those persons on the terms of the 1980 lease of Baryulgil Square.*

(Paragraph 10.29)

5 *That the Commonwealth Department of Aboriginal Affairs continue to use every effort to persuade the residents of Baryulgil Square to move to another site removed from any risk to health from the Baryulgil mine site.*

(Paragraph 10.29)

6 *That the Commonwealth Minister for Aboriginal Affairs recommend to the New South Wales Government that they institute a vigorous programme to decontaminate Baryulgil Square as far as possible.*

(Paragraph 10.29)

7 *That the Commonwealth Minister for Aboriginal Affairs request the New South Wales Government to direct the State Pollution Control Commission to continue to monitor the health risks from asbestos tailings at Baryulgil Square and to take whatever remedial measures may become necessary.*

(Paragraph 10.32)

8 *That, if future redevelopment of the asbestos deposits at Baryulgil should take place, consideration should be given to its possible creation of a renewed health*

risk at Baryulgil School, and that, if necessary, the school should be resited at another place within the Baryulgil area.

(Paragraph 10.32)

9 *That in the event of the closure of the school, funds should be made available for the immediate construction of a new school building at Malabugilmah; that application by the State Government should be made on the school's behalf to the National Assessment Panel which provides funding under the Capital Grants (Aboriginal and Torres Strait Islander Schools Element) program of the Commonwealth Schools Commission, and that the balance of funds should be provided by agreement between the Commonwealth and State Governments.*

(Paragraph 10.32)

10 *That the Commonwealth Minister for Aboriginal Affairs request the New South Wales Government to direct the Department of Mineral Resources to require the lessees of the site of the Baryulgil mine and mill to carry out a complete rehabilitation of the area, and, in the event of the lessee failing to comply, to direct the Department of Mineral Resources to carry out such rehabilitation work itself.*

(Paragraph 10.36)

Chapter 1

Establishment and Conduct of the Inquiry

THE COMMITTEE

1.1 The House of Representatives Standing Committee on Aboriginal Affairs was first appointed by resolution of the House in 1973 in the 28th Parliament.[1] The House has continued to appoint the Committee in each succeeding Parliament. The resolution appointing the Committee declares as its function to inquire into and report on such matters relating to the circumstances of the Aboriginal and Torres Strait Island people and the effect of policies and programs on them as are referred to it by resolution of the House or by the Minister for Aboriginal Affairs. The resolution of appointment declares the functions and powers of the Committee and establishes the procedural framework within which the Committee must operate. The procedures of the Committee are otherwise prescribed by the Standing Orders and practices of the House of Representatives.

1.2 The Committee has inquired into and reported on *Aboriginal Health* (1979),[2] *Alcohol Problems of Aboriginals* (1976),[3] *Aboriginal Legal Aid* (1980),[4] and *Aboriginal Town Camps* (1980),[5] among other matters. The Committee, in the present Parliament, is also conducting an inquiry into Aboriginal Education.

1.3 The Committee consists of 8 Members of the House of Representatives who hold office as a committee until the House is dissolved or expires by effluxion of time. The present Committee was constituted on 4 May 1984.

TERMS OF REFERENCE

1.4 On 19 September 1984 the Minister for Aboriginal Affairs, the Hon. A.C. Holding M.P., wrote to the Chairman of the Committee asking the Committee to accept a reference on the effects of asbestos mining on the Baryulgil community and proposing as terms of reference for the inquiry:

1 the effect of asbestos mining on the Aboriginal people who lived and/or worked at Baryulgil with particular reference to:

   (a) the conditions under which Aboriginals worked in the asbestos mine and processing plant; and

   (b) factors which contributed to any health risks associated with the mine and crushing plant, and the nature, adequacy and enforcement of safety measures to minimise such risks.

2 measures to protect and promote the health and welfare of the Aboriginal people who may have been affected by the Baryulgil mining operations.

3 provisions currently available to secure just compensation for individuals who have been adversely affected by the mining and processing activities at Baryulgil, and measures necessary to overcome any inadequacies in those provisions.

On 21 September, following a meeting at which the Committee resolved to accept the reference, the Chairman wrote to the Minister to that effect.

BACKGROUND TO THE INQUIRY

1.5 Chapter 2 of this report contains a history of the Aboriginal community at Baryulgil and the circumstances surrounding the establishment, operation and eventual closure of the asbestos mine at Baryulgil. The mine closed finally in April 1979. Since then increasing attention has focused on the effect that the operation of the mine had on the community that lived at Baryulgil and worked in the mine. This attention and concern has been closely related to rising anxiety in the community about the effects of asbestos mining on miners and process workers employed in the asbestos industry.

1.6 In 1977 an ABC journalist, Matt Peacock, produced a series of programs broadcast on ABC Radio on Broadband on the effects of the asbestos industry on the health of workers in the industry. The series included a documentary on Baryulgil. The series has since been published as a book by the ABC under the title of *Asbestos: Work as a Health Hazard.*[6] The series gave rise to enhanced media interest and was followed by television documentaries, reports and feature articles in a variety of newspapers.[7]

1.7 The image portrayed by this publicity was of an isolated community of Aboriginal people exposed to a dangerous environmental hazard resulting in widespread death and lingering disease for which they had not been able to obtain adequate compensation, either from the State tribunals administering the law such as the Workers' Compensation (Dust Diseases) Board or from the companies that had profited by the operation of the mine.

1.8 In 1981 the Select Committee of the Legislative Assembly of N.S.W. upon Aborigines found that:

> A strong belief exists in the community that a number of people at Baryulgil died from the effects of inhaling asbestos dust. Although some men at the settlement had worked in the asbestos mine for many years, they claimed to have been supplied with respirators and masks only about four or five years ago and that only a limited number of workers at the mine were supplied with this form of protection.
>
> Your Committee was told that for many years asbestos tailings were dumped round the houses and on the road at the reserve. These tailings blew into the air and covered young children who played amongst them. The people blame those tailings for the high rate of bronchitis. It was said that the asbestos tailings were covered with dirt about two years ago.
>
> When the asbestos mine was in full production it employed over sixty people. The claim was made that when an inspection was imminent, measures were taken to disguise the health hazards of the normal working conditions. It was further claimed that employees at the mine were not warned of health risks before being employed there.[8]

1.9 The Select Committee recommended an immediate investigation be instigated to determine the possible incidence of asbestosis among the Aboriginal community at Baryulgil.

1.10 In December 1982 the *House of Representatives Standing Committee on Environment & Conservation on Hazardous Chemicals* included in its report to the House a chapter on asbestos.[9] The National Health and Medical Research Council in 1981 reported on *The Health Hazards of Asbestos*[10] observing that 'Expert evidence suggests that it is not possible to establish a threshold value below which a carcinogenic effect of asbestos cannot be identified . . .' and recommending that 'exposure to asbestos be reduced to the lowest practicable level by the most efficient technology currently available and enforced . . .'.[11] Concern about the environmental effects of exposure to asbestos had surfaced in Europe and North America at a much earlier date. The history of these developments is traced in Chapter 3 of the report.

1.11 Concern about the possible past and future effects of exposure to asbestos mining gave rise to action by some trade unions with the establishment of pickets in buildings and schools where asbestos lagging had been used in airconditioning ducts. In this atmosphere

of general anxiety concerning assumed effects of exposure to asbestos, this Inquiry was taken up by the Committee.

1.12 The Aboriginal Legal Service Limited (A.L.S.) sought the present Inquiry on behalf of its Aboriginal clients from the Baryulgil area whom it was representing in proceedings for compensation before the various N.S.W. Courts and Tribunals. In a submission to the Minister for Aboriginal Affairs of 3 June 1984, the Aboriginal Legal Service submitted:

> The Aboriginal Legal Service (A.L.S.), has in recent weeks received instructions from over 100 people who seek compensation for asbestos related diseases. These people on 9th May, 1983 formed The James Hardie Asbestos Victims Association to represent their interests and convey instructions to the Aboriginal Legal Service. Our clients allege, in brief, that the asbestos mine at Baryulgil in North Eastern N.S.W., was so operated as to constitute a major health hazard not only to its employees but to the entire population of the Aboriginal village which adjoined the mine. We anticipate that should it be necessary to litigate on behalf of these claimants there will be over 100 claims. In brief it is contended that an entire Aboriginal community has, to varying extents, been exposed to asbestos contamination; and that approximately 100 people have either died or lost their health in consequence of this. We believe that a Medico-Legal Project of substantial proportions is needed to investigate the matter and to pursue appropriate compensation remedies.

1.13 In support of their submission for an Inquiry, the Aboriginal Legal Service made allegations that have since become familiar to this Inquiry:

> The miners who worked at the Baryulgil mine were, throughout their employment, exposed to levels of airborne asbestos dust which can properly be described as unconscionable. Throughout the 1960's and the first half of the 1970's the then acceptable standard for airborne asbestos dust was 4 fibres per cubic centimetre. Yet miners describe quarrying in a dense cloud of dust, being unable to see the wall inside the mill from a distance of a few yards, and shovelling asbestos dust into sacks whilst in such a dust cloud as to be unable to see the man holding the sack.
>
> Periodic dust counts at certain sites around the mine show that at one site in September, 1970 the airborne asbestos dust reading was 1760 fibres per c.c. When the readings for the period 1970 to 1976 are averaged it is seen that not one of the 12 sampling sites had readings at or below the acceptable level. These monthly dust count results incidentally are in our possession and over the signature of Senior James Hardie Personnel.
>
> Incidentally the current acceptable level is no longer 4 fibres per c.c. but 2 and there are moves underway to lower the level to 1 fibre per c.c.
>
> As a further matter of interest and concern there is ample evidence to establish that blue Asbestos (crocidolite) was imported on to the site in used asbestos bags and that workers came into contact with it. Blue asbestos has a reputation as a potent carcinogen and is regarded as being even more dangerous than white asbestos.

The submission went on to allege:

> The main danger posed by the mine was to those who worked in it. However, the families of the miners and other residents of Baryulgil Square were also exposed to substantial amounts of asbestos dust. Some have respiratory problems which we suspect are asbestos related while many others, especially children, must be regarded as being at risk due to the future likelihood of asbestos related cancer.
>
> Most mine tailings were dumped at the mine. However, this finely ground rock provided a convenient source of construction material. It was used by the truck load to resurface the tracks around Baryulgil Square especially after rain. It was used to surface the ground around the houses at Baryulgil and as playpits for children. The miners used to bring the tailings in mine trucks down to Baryulgil Square for these purposes. The permission of the Mine Manager had always to be obtained to use the tailings and trucks in this way.
>
> The tailings were also used at the Baryulgil Public School in the construction of its foundations and for surfacing the playground especially after rain. They were also used by the

Copmanhurst Shire Council to surface local roads and patches of it are visible today.

1.14 The submission directed attention to what was foreseen as 'legal hurdles' to obtaining adequate compensation for those affected by past exposure:

> We anticipate some obstacles to an efficient recovery of all Plaintiffs. Some of these difficulties are outlined below although, as time passes, some of these difficulties will be overcome.
>
> (a) The Dust Diseases Board has no jurisdiction to award compensation to a non worker. Thus there is no hope of relief from that quarter for the wives and children of miners in respect of their own present and future asbestos related diseases.
>
> (b) The Dust Diseases Board seems to have a policy of avoiding lump sum payments in favour of periodic income maintenance payments.
>
> (c) Difficulties of proof will arise. Not only is asbestosis difficult to diagnose in a living person but in the case of many who have died in recent years medical records are scanty. We are concerned that many relatives of deceased miners may have difficulty in establishing to the necessary standard that the miner concerned actually died of asbestosis. These difficulties are compounded by the passage of time.
>
> (d) The Limitation Act may well bar many claims. For example, [one woman] was widowed in 1971. Her late husband exhibited almost the whole range of asbestosis symptoms. [This woman] raised her 14 children in difficult circumstances and first knew of the possibility of compensation when our Project Team interviewed her two weeks ago.
>
> (e) The Compensation to Relatives Act N.S.W. has loop holes which may deprive some claimants of a remedy. Until an amendment in recent years defacto wives had no claim. As the amendment was not retrospective defacto wives whose husbands died before the amendment may be without a remedy. Some of these defacto marriages may in fact be proper marriages by the customs and usages of the Bunjalung Community — which raises the issue of customary marriages.
>
> (f) The James Hardie Group will no doubt be keen to rely on the fact that AMPL was a 'separate' legal entity.
>
> (g) Assuming the Plaintiffs win Judgment we are concerned of the possibility that our clients may not be able to recover on the Judgment. AMPL may have few assets and limited insurance cover.

1.15 This led the Aboriginal Legal Service to indicate that the inadequacy of legal remedies would require the Inquiry to design a compensation scheme which would cover:

> a. The provision of onsite medical care facilities to provide counselling, diagnosis, treatment and monitoring services.
>
> b. A housing programme for affected families which do not at present enjoy good housing.
>
> c. A job creation programme for affected people still able to work.
>
> d. Financial compensation by way of lump sum awards to affected miners, relatives of miners who died due to asbestos related disease, and other adversely affected by exposure to asbestos.
>
> e. Land.
>
> It is our client's belief that a remedial and compensatory programme along the above lines would, provided the overall quantum was sufficient, go a long way towards undoing the harm that has been done to the community.

These submissions by the Aboriginal Legal Service persuaded the Minister to refer these matters for investigation by the Committee.

THE COMMITTEE'S APPROACH TO THE INQUIRY

1.16 The Committee has followed the established pattern of Inquiries by select committees of the Parliament in its conduct of the Inquiry. It advertised the terms of reference widely in the national press and newspapers circulating in the Grafton area, seeking submissions to the Inquiry. It personally approached individuals and organisations thought to have an interest in the subject matter of the Inquiry or the knowledge or skills to assist the Committee. It has conducted public hearings of evidence at which witnesses were invited to appear to give evidence in relation to written submissions previously lodged with the Committee. In Appendix 2 of this report are listed the names of individuals and organisations that have made submissions. Also in Appendix 2 are details including witnesses who have given evidence at the public hearings held by the Committee.

1.17 The Committee has been assisted in the Inquiry by three consultants: Mr Neil Gunningham, Senior Lecturer in Law at the Australian National University, and Dr Adrian Merritt, Senior Lecturer in Law at the University of New South Wales, both of whom are specialists in the field of Occupational Health and Safety Law; in relation to the medical aspects of the Inquiry, Professor Bruce Armstrong, Director of the National Health & Medical Research Council Unit in Epidemiology and Preventive Medicine, University of Western Australia, has assisted the Committee.

DIFFICULTIES CONFRONTING THE COMMITTEE IN THE CONDUCT OF THE INQUIRY

1.18 This has been, in many respects, an unusual Inquiry to be undertaken by a select committee of the Parliament. It is focused more narrowly than the general policy issues with which this Committee has previously been concerned. The circumstances outlined giving rise to the Inquiry have involved allegations of a grave nature directed against the companies that operated the asbestos mine at Baryulgil. This has resulted in considerable defensiveness on the part of those parties. In this Inquiry we have been asked to resolve many issues of fact, often technical in nature, on the basis of inadequate and disputed data. An objective of the report is to state as accurately as possible the actual situation both in relation to the history of the mine and the health consequences that have resulted for employees and others exposed to asbestos fibre in the environment of Baryulgil Square.

SUB JUDICE

1.19 A problem with which the Committee was confronted at the outset of the Inquiry was the fact that many of the issues raised were also the subject of litigations in the courts, that is to say *sub judice*. Many of the former miners, clients of the Aboriginal Legal Service had instituted or were about to institute proceedings against Asbestos Mines Pty Limited. For the former operator, the James Hardie Group of Companies (hereafter Hardies), the problem was more complicated. Hardies was represented in the Inquiry by one of its subsidiaries Hardies Trading (Services) Pty Limited (hereafter Hardies Trading). At the commencement of the Inquiry the Principal Executive Officer of this Company, Mr J.C. Kelso, wrote to the Committee:

> Neither James Hardie Industries Limited nor any operating subsidiary within the James Hardie Group will be making any submission to the Committee for commercial reasons relating to insurance policies held by Companies within the Group. These policies relate to claims which have been made or may be made by former employees or other persons with

respect to alleged exposure to asbestos or asbestos materials at the Baryulgil Mine and at other places and on other occasions not associated in any way with the Baryulgil Mine.

Although the James Hardie Group wishes to be as helpful and co-operative to the Inquiry as these limitations permit, Hardie Trading (Services) Pty Limited and any person subsequently making oral submissions to the Committee on its behalf is not authorised or empowered by James Hardie Industries Limited or any other Company within the James Hardie Group to make admissions on its behalf of any fact or any matter. It is not expected that this will in any way diminish the amount of information that may be available to your Committee.

1.20 The company has requested that, for these reasons, proceedings be held *in camera* and referred to the *sub judice* convention.

1.21 Under the sub judice convention and within certain established practices the House of Representatives imposes a restriction upon itself in the case of matters awaiting or under adjudication in a court of law. This voluntary restriction is to prevent comment and debate in the House from exerting an influence on juries and from prejudicing the positions of parties and witnesses in court proceedings. Application of the convention is subject always to the discretion of the Speaker.[12] Parliamentary committees are bound by the same convention. The chairman of a committee, like the Speaker, may exercise discretion as to whether the convention should apply in a given situation, but he must have regard to the principles followed by the Speaker in the House and the option that is open to the Committee to take evidence *in camera*.

1.22 As already noted Hardies Trading requested that 'the committee apply the *sub judice* convention to its original submissions and to the evidence or documents which might be adduced or produced by the Company or any person making oral submissions on its behalf at the request of the Committee.'

1.23 The Committee had to balance this consideration with the desirability of its proceedings being held in public. It held the initial hearing *in camera* and attended to argument by interested participants on the question whether there should be public or *in camera* hearings. It determined the matter in favour of the principle that its proceedings should be open and public with the reservation that affected parties could raise the *sub judice* convention and thereby invoke the Chairman's discretion.

1.24 Hardie Trading have regularly invoked the convention. On each occasion the request has been considered by the Chairman and, in consultation with the Committee, has made a ruling on the public record.

EVIDENCE OF HARDIE TRADING

1.25 The policy adopted by Hardies in relation to the Inquiry meant that the Committee was not in a position to take evidence from those employees of Hardies, Mr Winters, Chief Hygiene Officer and Dr McCullagh, the Medical Officer, whose long involvement with the mining operation at Baryulgil would have made them valuable witnesses to the events under consideration. Although Mr Kelso promised to be bountiful in the provision of material most of the information he submitted was selected to support points he wished to make in the Inquiry or to rebut allegations made by the Aboriginal Legal Service Limited. Requests by the Committee for information were either rejected or politely avoided. Thus a request for a description of how the mine operated elicited three blandly worded paragraphs. The Company responded to the Committee's request that it provide:

- a list of documents relating to the operation of the asbestos mine at Baryulgil still in its possession; and
- internal medical assessment and reports relating to risks associated with asbestos;

in the following terms:

I regret to advise that the company has received legal opinion that because of litigation pending against companies in the James Hardie Group and the difficulty that the Committee faces in controlling the use of material presented to it, I am unable to comply with that request.

EVIDENCE OF FORMER MINE WORKERS

1.26 The events with which the Inquiry has been concerned occurred many years ago. For the period 1970 to the closure of the mine the data available to us is by no means comprehensive but is comparatively rich compared to that relating to the earlier years of the mine's operation. For the period of the '60's we have had to rely on eye witness accounts of former employees and fragmented documentary material which became available through the 'Burke Papers' referred to below. The Department of Health and the N.S.W. Department of Industrial Relations made available reports by mine inspectors. However, apart from some scientific officers of the Department of Industrial Relations who had been involved in dust measurement and safety control during the late '60's and '70's the evidence available is flimsy. The period before the operation of the new mine from the commencement of operations in 1944 is scant and anecdotal.

1.27 Many of those who gave evidence to the Committee were clients of the Aboriginal Legal Service with pending claims for compensation. Others might expect to benefit were the Committee to recommend some form of compensation. The Committee has therefore had to rely on sources of information that would in ordinary circumstances be seen as impressionistic, subjective and therefore unreliable. The former mine manager, Mr Burke, also the source of the documents referred to below, paragraph 1.32, must be regarded as the most direct source of evidence concerning the history of the operation of the mine. Mr Burke was employed by Asbestos Mines Pty Limited for a period of 23 years. The first 9 of these years were as foreman and the remainder as local manager which was the position he occupied at the time the mine was closed. He worked at the mine before the construction of the new mill and participated in designing and constructing the new mill. Mr Burke gave evidence to the Inquiry on two occasions. He was also the source of the documents concerning the operations of the mines referred to below.

1.28 Hardies Trading objected to Mr Burke giving evidence to the Committee on the first occasion on which he appeared (see transcript page 202) and he falls within that category of former mine employees who may be involved in litigations. His evidence is to be read, therefore, in that light. The Committee did not find him an altogether satisfactory witness. His oral testimony was contradictory on some matters.[13] He was asked specifically to attend the public hearing on 13 August 1984 to identify and table documents in his possession relating to the operations of the Mine. He was asked:

> CHAIRMAN — Is this a complete set of all the documents you have?
>
> Mr Burke — As far as I am aware it is.
>
> CHAIRMAN — And there is no other material that you have relating to this issue?
>
> Mr Burke — Not that I am aware of.
>
> CHAIRMAN — These documents are all documents which were addressed to you, are they?
>
> Mr Burke — Yes, in my capacity as manager.

Shortly after Mr Burke sent some 5 kg of additional and previously unmentioned documents to the Committee.

ABORIGINAL LEGAL SERVICE

1.29 The case has been presented on behalf of former members of the Baryulgil community and their dependants by the Aboriginal Legal Service. Aspects of the presentation have been of concern to the Committee. From the outset the Service set Hardies up as principal villains in the piece and concentrated its case on the operation of the mine and the mill. This was to place the Hardies organisation in the position of defendants in proceedings which became unduly adversarial in nature. The Committee has not been assisted by this approach. As noted earlier, by placing Hardies on the defensive, the flow of information to the Committee has been restricted. The approach led to the main emphasis being on the operation of the mine and mill. The Aboriginal Legal Service were less confident in presenting the argument concerning the health consequences of that operation.

1.30 Representatives of the Aboriginal Legal Service were unable to support many of the wilder claims made both inside and outside the Inquiry when pressed by the Committee for evidence to support these claims.[14] It is unfortunate that this has created a public perception of what happened at Baryulgil quite out of keeping with the true facts. The medical evidence discussed in Chapter 7 is incomplete and equivocal in many respects but it certainly does not support the allegations of widespread death and disease among the former miners at Baryulgil. The Committee hopes that this report will have the effect of placing matters in perspective.

1.31 Considerable emphasis has been placed on the fact that the miners and the community that resided at the Square are an Aboriginal community. The Aboriginal origins of the miners has lent poignancy to their plight. There have been suggestions that there was an element of exploitation by the companies operating the mine — of a people made vulnerable by isolation and naivety. To the extent that the Aboriginal Legal Service in particular have been specific in their allegations, the charges have been considered in this report. These charges related to such matters as the failure to supply proper safety equipment and protective clothing, or facilities such as showers and lockers, or to take responsibility for the health care of Baryulgil workers. There have also been charges that wages were paid below the award rate. It will be seen from this report that some of these charges have been made out. However, the Committee rejects the suggestion that there was a deliberate intention to exploit an Aboriginal community. Similar conclusions to those reported at Baryulgil were reported at the Wittenoom asbestos mine where the workforce was predominantly Caucasian. The fact of isolation and the lack of union involvement in the operations, however, might have contributed to a situation where industrial safety and hygiene methods were lax by the standards of more populous and sophisticated mining communities.[15]

DOCUMENTS RELATING TO THE OPERATION OF THE MILL

1.32 The Aboriginal Legal Service relied on a series of documents, appended to its first submission to the Inquiry, consisting of photocopies of documents which appeared to be original internal memoranda circulating between Asbestos Mines Pty Limited and other companies in the James Hardie Group. It later emerged that these documents were part of a collection of papers that Mr Gerry Burke, the manager of Asbestos Mines Pty Limited, had gathered during his time as manager. He had made this collection of documents, or parts of them, available to the Aboriginal Legal Service.

1.33 The Committee has concluded that there is no reason for believing that 'the Burke documents' are not genuine copies of internal company memoranda. It is clear that they are a selection of documents and are by no means a complete record of any particular

aspect of the operation of the mine. It is also clear that the selection has been used selectively by the Aboriginal Legal Service and by Mr Burke himself. To the extent that the Committee has relied on these 'Burke documents' in reaching conclusions in the report, it has taken these considerations into account. It also places on record the fact that it has sought from the companies which operated the mine access to records still existing of the mine operation. This access has not been provided. The Committee notes that where, at various stages in the Inquiry, Woodsreef Mines Pty Limited or Hardie Trading (Services) Pty Limited have wanted to refute a point, they have been able to produce records from the days of the operation of the mine. They therefore appear to be using such records as they still possess, selectively. The Committee has compiled this report on the basis of the evidence that has been presented to it or that it has been able to obtain. Where it has relied on any of the papers in the 'Burke collection', it has concluded that the documents in question could be regarded as accurate on their face in the absence of any advice to the contrary by Hardie Trading or Woodsreef Mines Pty Limited.

ENDNOTES

1 See Appendix 1.

2 Australia. Parliament, *Aboriginal Health: Report from the House of Representatives Standing Committee on Aboriginal Affairs*, Parl. Paper 60/79, (Canberra, 20 March 1979).

3 Australia. Parliament, *Alcohol Problems of Aboriginals: Report from the House of Representatives Standing Committee on Aboriginal Affairs*, Parl. Paper 299/77, (Canberra, 1972).

4 Australia. Parliament, *Aboriginal Legal Aid: Report from the House of Representatives Standing Committee on Aboriginal Affairs*, Parl. Paper 149/80, (Canberra, 1980).

5 Australia. Parliament, *Strategies to Help Overcome the Problems of Aboriginal Town Camps: Report from the House of Representatives Standing Committee on Aboriginal Affairs*, Parl. Paper 366/82, (Canberra, 1982).

6 Peacock, M. *Asbestos: Work as a Health Hazard*, (Sydney, 1978).

7

Financial Review	28 July 1978
The Australian	28 July 1978
Sydney Morning Herald	24 September 1983
The Australian	1 October 1977
Penthouse	August 1980
National Times	27 May 1983

8 N.S.W. Parliament — *Second Report from the Select Committee of the Legislative Assembly upon Aborigines* — (1981), pp. 153–154.

9 Australia. Parliament, *Hazardous Chemical Wastes — First Report, Report from the House of Representatives Standing Committee on Environment and Conservation*, Parl. Paper 104/82, (Canberra, 1982).

Australia. Parliament, *Hazardous Chemical Wastes — Second Report, Report from the House of Representatives Standing Committee on Environment and Conservation*, Parl. Paper 445/82, (Canberra, 1982).

10 Australia, Department of Health, National Health and Medical Research Council — *Report on the Health Hazards of Asbestos* — June 1981.

11 *Ibid*, p.3.

12 Pettifer, J. (Ed.), *House of Representatives Practice*, (Canberra, 1982), p.464.

13 Transcript of Evidence, p.2588.

14 Transcript of Evidence, pp.2358–2380.

15 Layman, L. *Occupational Health at Wittenoom 1943–1966*, paper presented to the ANZSEARCH/APHA Conference — (University of Adelaide, May 1984) see p.7 & p.13.

Chapter 2

The History of the Baryulgil Community in relation to the Mine and Mill

SETTLEMENT OF THE COMMUNITY AT BARYULGIL SQUARE

2.1 The Aboriginal people who form the 'Baryulgil community' are members of the Bunjalung tribe from the New South Wales North Coast region.[1] At the beginning of this century, they resided on an area set aside for them on Yugilbar Station about 10 kilometres from Baryulgil Square.[2] Some time around 1920, the people moved to Baryulgil Square. The submissions of the Aboriginal Legal Service and of Miss Vivienne Abraham, solicitor for the Baryulgil Square Co-operative, both refer to the move, but differ on details. The Aboriginal Legal Service states[3] that the move occurred in 1918. They say that:

> when in 1918, it was suggested to the community that its people be relocated to Baryulgil they were receptive to the idea. Mrs Daley[4] recalls that a meeting was held at which several white people encouraged the community to abandon the old reserve and move to a new one near the store . . . the outcome was that the Aboriginal community agreed to move to Baryulgil and to set up their homes on the land that is now Baryulgil Square.[5]

Miss Abraham states that the move occurred in the 1920s:

> Mrs Lucy Daley . . . remembers Aboriginal families on the Clarence River flats (below the Castle, as the Yugilbar homestead is known as) and others living in the areas adjoining Baryulgil Square, moving to the Square in the 1920s.[6]

2.2 Both the Aboriginal Legal Service and Miss Abraham state that at that time the Square was also part of Yugilbar Station.[7] Miss Abraham refers to a belief in the community that a 99 year lease of the Square was granted to Harry Mundine, Norman Daley and Kenneth Gordon as trustees for the community sometime in the mid-1940s.[8] However, she states later that in January 1975 inquiries were made to discover if there was such a lease, and that it was found that the 'N.S.W. Government Gazette of 12/7/1974 notified the issue of a Crown Grant of the freehold of the Square to the Aboriginal Lands Trust of N.S.W. under Section 17A of *Aborigines Act 1969*.'[9] This is reinforced by the Aboriginal Legal Service submission which states that 'in 1960 (the Square) was formally gazetted as an Aboriginal reserve and transferred to the Aboriginal Lands Trust in 1975. Following the abolition of the Trust in 1983 the reserve is now vested in the N.S.W. Government,'[10] and by Miss Abraham herself who noted that 'Baryulgil Square was gazetted as A.R. 82681 on 5.6.1960, i.e. Reserved from Sale for the use of Aborigines.'[11]

COMMENCEMENT OF THE BARYULGIL MINE

2.3 The Aboriginal Legal Service states that the asbestos deposit at Baryulgil was discovered in 1918, and that mining started soon after.[12] They quote Mrs Daley as saying 'they started opening up the mine soon after we moved to Baryulgil Square and they wanted the men to work there, but they only did this for a while and they closed the mine. It was not started up again until years later.'[13]

2.4 This tallies with the submission of Hardie Trading (Services) Proprietary Ltd which states that:

> The existence of the asbestos was known as long ago as 1918 because of the outcroppings which were visible at the site of what was later to be the quarry . . . The chrysotile deposit

was first developed during the 1914–1918 War, although there is no record of production from this centre prior to 1942.[14]

2.5 Hardie Trading (Services) Proprietary Ltd go on to state that development was recommenced in 1940 by Wunderlich Ltd, leading to a production of 103 tons of fibre in 1942, and that the mining plant was established in 1943. In 1944 the company Asbestos Mines Pty Ltd was formed to operate the mine, 50% of the shares being held by Wunderlich and 50% by the James Hardie Group.[15]

2.6 The people of Baryulgil Square from the beginning formed the core of the workforce of the mine and mill. The Aboriginal Legal Service states that:

> The mine operators relied on the Aboriginal community for labour to such an extent that for the next 35 years approximately 95% of the work-force was Aboriginal . . . Not only were there sufficient jobs to ensure full employment for the Baryulgil community but the demand for labour was such that Aboriginal people from outside the Baryulgil community travelled there to work at the mine. People came from the reserves at Tabulam and Muli Muli, from Casino, Kyogle, Grafton, Yamba and Kempsey, a few Queenslanders and Torres Strait Islanders came too. The usual pattern for people who came from, for example, Tabulam, was for them to live at the Square from Monday through Friday and return to their home reserves on the weekend.[16]

CONDITIONS AT THE SQUARE DURING THE PERIOD OF OPERATION OF THE BARYULGIL MINE AND MILL

2.7 The operation of the mine and mill did provide advantages that differentiated the Baryulgil Square reserve from many other Aboriginal reserves in New South Wales. The Aboriginal Legal Service comments:

> These days from the 1940s to 1979 were in a sense Baryulgil's heyday. Full employment meant that the community broke away from the chronic poverty which characterised other rural reserves. Individual breadwinners had the satisfaction of providing for their families and of doing hard work well . . . Life in the Square was not idyllic by any means however. Housing was decidedly spartan. Educational facilities left a lot to be desired — although in recent years they have improved greatly. Health care facilities were almost non-existent and although the wages dispelled chronic poverty they were insufficient to ensure real prosperity.[17]

2.8 It appears that the houses at the Square were built by members of the community from whatever materials they could obtain. The submission of the Department of Aboriginal Affairs states that, in 1975, when they first became involved with the Baryulgil community:

> living conditions on the Reserve were sub-standard. Housing consisted of 14 self-constructed dwellings with an inadequate water supply.[18]

2.9 The Department further states that in 1976 they provided $43 244 through the Copmanhurst Shire Council 'for a Special Works Project on and adjacent to the Reserve', which 'included rubbish removal, fence construction, provision of a playground, minor house repairs and road works',[19] and that in 1977 they provided $9470 to the Aboriginal Land Trust for upgrading the water supply at the Square.[20]

2.10 In 1977–78, the Department began planning for a rebuilding program to include 20 new houses, electricity, water and sewerage, with $114 000 approved for 1978/79 and a further $195 000 estimated for 1979/80.[21] However, following the growth of concern about the health risk at the Square from contamination on site and from the proximity of the mine and mill:

> DAA's New South Wales Regional Director decided that the views of Commonwealth and State Health authorities should be sought before proceeding with the Baryulgil rebuilding programme.[22]

2.11 As a result of these investigations, the Department entered into discussions with the community with a view to their relocation at a healthier site (see paragraphs 2.22 to 2.24 below).

2.12 The Department states that while it:

> has been reluctant to provide more than basic services to the residents remaining at Baryulgil Square on the grounds that better facilities might encourage other people to take up residence despite the health risk . . . the improvements have led to new building at, and some inward migration to, Baryulgil Square. DAA spent $14 087 in 1982/83, however, to provide electricity, septic tanks and upgrade the water pump at the Square . . . The ADC has provided $50 445 to renovate the six houses remaining at Baryulgil Square. In addition to Commonwealth funding, the New South Wales Ministry of Aboriginal Affairs has provided $8000 to improve conditions at Baryulgil.[23]

USE OF ASBESTOS TAILINGS AT BARYULGIL SQUARE

2.13 Evidence has been given to the Committee that tailings from the mine and mill were made available to the residents of the Square who used them for levelling and surfacing the area around their houses and as 'sand-pits' for their children. The Aboriginal Legal Service stated in their submission:

> . . . the most extensive and serious cause of secondary pollution was the widespread use of mine tailings as a surfacing material in Baryulgil Square. As the area has high rainfall at some times of the year, and as the roads within Baryulgil Square were little more than dirt tracks, those roads frequently became boggy. Early in the mine's history the practice was established of spreading mine tailings on these roads and around the houses to provide a surfacing material. We have not been able to determine accurately when this practice first commenced but it was probably within the first five years of the mine's estasblishment, that is the early 1950's. The 'Northern Star' article referred to earlier, notes the then Mine Manager, Mr Allen, claiming to have the cheapest road surfacing material available for councils and notes also that extensive use was made of this material in the area surrounding the mine. The practice of spreading asbestos tailings in and around Baryulgil Square continued until 1977. We are unable to say with certainty how often tailings were spread about the Square each year but it appears that this took place between 15 and 30 times per annum.
>
> The usual procedure was for Baryulgil Square residents, having noticed that the roads and areas surrounding their houses were becoming boggy, to obtain the Manager's permission to take a truck load or sometimes several truck loads of 'shivers' down to the Square and spread them about the Square. One resident describes how the children delighted in running along after the trucks which were spreading the asbestos and kicking up the dust, rolling in it and the like. The spreading of the shivers generated an extensive cloud dust.
>
> Over the years very substantial amounts of tailings were dumped in Baryulgil Square by this means. It is not possible to estimate the quantity of tailings which polluted Baryulgil Square in this way but a rough estimate would be to say that 20 truck loads per year were spread over a period of 25 years. This is a conservative estimate.
>
> The tailings were often dumped near the houses as play pits for children.
>
> When there had been no rain for some time the surface soil and tailings which had been dumped in the Square became dry and the dust blew about readily. The dust was further stirred up by vehicles and pedestrians. It is not possible to estimate with any precision the airborne asbestos fibre levels which resulted from this secondary pollution of Baryulgil Square. However, the residents described to us seeing a dusty haze not only in the area around the houses but also inside the houses themselves. The dust would settle on window ledges, tables, plates, etc.[24]

Members of the Community also referred to this practice during the Public Hearing at Baryulgil on 6 February 1984:

Mr BLANCHARD — Who put the tailings on the roads as fillings? Who was responsible for that?

Mr Marshall — We used to ask the manager.

Mr BLANCHARD — Was this your request?

Mr Marshall — Yes, our own request. We would go and ask the manager whether we could do it. We would tell him what we wanted it for.

Mr BLANCHARD — Did the Shire Council have any part in the operation?

Mr Walker — No, it never used to do the road in the Square then. It used to use it on the main roads, though.

Mr BLANCHARD — But it did use it on the access roads?

Mr Walker — Yes. It has even taken truck loads of it to town. We used to have people come out from town and get it because it makes a beautiful lawn. If you spread it about two inches thick you get beautiful thick grass.

Mrs Gordon — That is why we used to spread it around our houses, to make the grass grow greener.[25]

2.14 The practice of spreading tailings in the Square was apparently discontinued late in 1977 or early in 1978. Referring to the survey of the Baryulgil community commenced in 1977 by the Division of Occupational Health and to a series of broadcasts by ABC journalist Matt Peacock, which had dealt with health hazards at Baryulgil, the Aboriginal Legal Service stated that:

> As a consequence of the Division of Occupational Health's involvement and of Peacock's exposé official reaction was swift. The practice of spreading tailings about the reserve ceased, the tailings in the reserve were to an extent, covered over . . .[26]

The Department of Aboriginal Affairs Submission stated that in November 1977, the New South Wales Health Commission:

> brought to DAA's attention the use of asbestos tailings on roads and grounds in the Reserve. The Health Commission recommended removal or covering of the tailings because of 'possible dangers'. In conjunction with the ALT and the Shire, DAA provided $9032 for these tailings to be covered with topsoil. The work was carried out in December 1977.[27]

2.15 A geological survey of the Baryulgil area was carried out in October 1980 at the Department of Aboriginal Affairs' request. The geologist, Mr K.C. Cross, commented, in relation to Baryulgil Square, that:

> Tailings dumped in the Square were used to level uneven and, in the majority of cases, appreciably sloping ground. Therefore, erosion of soil cover is likely to continue to re-expose the tailings. Ants may also continue to play a significant role in bringing asbestos to the surface.[28]

CLOSURE OF THE BARYULGIL MINE AND MILL

2.16 In April 1979, Asbestos Mines Pty Ltd ceased to operate the mine and mill.[29] The quarry was allowed to fill to form a lake, and reafforestation of the tailings dump was undertaken.[30] The submission of Woodsreef Mines Ltd states that:

> substantial time and funds have been contributed by the Company to rehabilitate the area to the satisfaction of the Department of Mineral Resources and the owners of the property. The last of this work has been completed this year in conformity with an agreement entered into by the Company with the owners of the property several years ago.[31]

2.17 However, an environmental survey commissioned by the Aboriginal Legal Service suggests that rehabilitation of the area is not complete, and that the tailings dump is still causing pollution, through wind and water run-off, of Baryulgil Square.[32]

2.18 With the closure of the mine and mill, there was very little employment available in the area for members of the Baryulgil Community. The Aboriginal Legal Service submission states that:

> The people of Baryulgil and nearby regions, who had for so long been independent of government welfare payments, now became dependent on the welfare system. The post-1979 era sees the population of Baryulgil Square dwindle as people move away to surrounding towns and to Sydney in the quest for work . . . The people of Baryulgil and neighbouring areas now face an uncertain future. A community with a long history of full employment now has virtually no employment opportunities and is welfare-dependent.[33]

The submission of Frank Roberts, representative of the National Aboriginal Conference, states that 'It is a fact that most of the mature younger people have left the area in search of work.'[34]

ESTABLISHMENT OF THE BARYULGIL SQUARE CO-OPERATIVE

2.19 Discussions and meetings of the community at Baryulgil Square late in 1976 resolved to form a co-operative and to seek a 99-year lease of the Square from the holder of the freehold title, the Aboriginal Lands Trust.[35] This culminated in the registration on 10 November 1968 of the Baryulgil Square Co-operative Limited as a community advancement co-operative society under the *Co-operative Act* 1923 (NSW).[36]

2.20 The rules of the Co-operative, which had been discussed at community meetings over the preceding two years, provided that membership of the Co-operative should be limited to Aboriginals living on the Square or descendant from one of the three original families at the Square — the Mundine, Daley and Gordon families. The Directors were all to be members of those three families.[37]

2.21 On 22 October 1980 the Aboriginal Lands Trust granted a 99-year lease of the Square to the Baryulgil Square Co-operative Ltd. The term of the lease was from 1 January 1980 to 31 January 2079. The lease was registered on 27 November 1980. Clause 7, relating to user, stated:

> At all times during the term to use the demised premises only for the continuation and furtherance of Aboriginal use and occupation in accordance with the desires of the members of the Baryulgil Square Co-operative Ltd living on the Square and all descendants of the three original families, namely Daley, Gordon and Mundine, whether they live on the Square or not.[38]

ESTABLISHMENT OF MALABUGILMAH

2.22 In 1979, the Department of Aboriginal Affairs became increasingly concerned about possible health hazards at Baryulgil Square because of contamination from asbestos tailings previously used there as surfacing and fill and because of its proximity to the site of the mine and mill and, even after the closure of the mine and mill in April, to the tailings dump. Accordingly, the Department decided to defer any further expenditure of funds for upgrading conditions at the Square.[39] The Department, through its Area Officer, had first 'discussed with the Community the desirability of moving away from the health risk associated with the asbestos mine' but 'The community was not willing to consider the option of moving at that time'.[40] However the Department's increasing concern led to the proposal for relocation being raised again, and it was supported by the then Minister, Senator Chaney, on a visit to Baryulgil in December 1979.[41] The Department of Aboriginal Affairs submission states that:

> In May 1980, a leading member of the Baryulgil Community informed DAA that the residents had been discussing the Minister's offer of relocation, and that an overwhelming majority of

residents had decided to move from Baryulgil Square to a new location nearby. A small number of families intended to stay at the Square. At a public meeting in June 1980, 27 of the 31 adult residents of Baryulgil Square voted to move to the new site.[42]

A new organisation, the Malabugilmah Aboriginal Corporation, was set up by those people who had decided to leave the Square, and by September 1980 they had submitted a development application to the Shire Council, which was supported by the Department of Aboriginal Affairs.[43]

2.23 On 10 December 1980, the Minister, then Senator Baume, announced a decision to develop a new site. 'By March 1981, a new site had been acquired, Shire approval for the development had been obtained, the site had been surveyed and the first earthworks commenced. The first house was opened and occupied on 2 July 1981'.[44]

PURCHASE OF COLLUM COLLUM STATION

2.24 The Department of Aboriginal Affairs submission stated that consideration of a proposal from the former Aboriginal Land Fund Commission to purchase Collum Collum station, near Baryulgil, for the Baryulgil Community commenced at the end of 1977.[45] The station was purchased by the Aboriginal Land Fund Commission in 1979 for $250 511, of which a holding deposit of $2000 was paid in the financial year 1978/79.[46] The station is a cattle property comprising 10 000 acres of freehold and 8500 acres of leasehold.[47] After July 1980, title to the property passed to the Aboriginal Development Commission.[48]

2.25 Initially, Collum Collum was run by the Baryulgil Square Co-operative Limited. The Aboriginal Development Commission stated that:

> The existence at this time of two community organisations, Baryulgil Square Co-operative and Malabugilmah Aboriginal Corporation, created difficulties with administration of Collum Collum station. The Aboriginal Development Commission was concerned that community harmony and involvement be preserved and maximised, and at the Commission's instigation in 1981, control of the Station passed from Baryulgil Square Co-operative to a newly formed representative organisation, Collum Collum Aboriginal Corporation.[49]

2.26 The Aboriginal Development Commission said that it 'has continued to support the development of Collum Collum as a viable economic enterprise providing employment, income and social development for the Community'.[50] In 1983 they granted a five-year lease of the property to Collum Collum Aboriginal Corporation, and intend to transfer title to Collum Collum Aboriginal Corporation at the end of that term.[51]

2.27 At the time the Committee took evidence from the Aboriginal Development Commission, Collum Collum was carrying 420 breeding cows, 70 growing heifers and 150 marketable cattle. They expected 300 calves in 1985. The station is run by a non-Aboriginal manager, and three Aboriginal employees.[52]

2.28 The Aboriginal Development Commission has also been 'investigating the possibility of exploiting the natural and scenic advantages of Collum Collum Station as a facility for tourists'. A draft proposal prepared for them by architectural and engineering consultants envisages a five-year construction program at a cost of $1.6 million. The proposal would provide employment for 12 people in the construction stage, and thereafter permanent employment for 12 people.[53] However, Mr Donnelly, representing the Aboriginal Development Commission, stated that the Community were not in favour of the particular proposal though they were in favour of the general concept of development of Collum Collum station.[54] The Committee has since been informed of a consultants report on this proposal, concluding that the project was not economically viable. The proposal is now unlikely to go forward. There is, however, a new proposal

under consideration. This would provide wilderness-holiday experience for disadvantaged children of the inner Sydney City area at Collum-Collum station. The project would be a co-operative venture of the Sydney City Mission and the Collum-Collum Aboriginal Co-operative. It would need to be supported by Commonwealth Government funding and approaches have been made to the Minister for Aboriginal Affairs seeking Commonwealth funding support. The Sydney City Mission has considerable experience in welfare work with inner city youth. It employs a number of trained and experienced youth workers. It is believed that such a project would create valuable employment experience for some members of the Baryulgil/Malabugilmah communities and the opportunity for some to be trained as youth workers. As well as the socially valuable result of providing holidays and wilderness experience for inner city youths the project would have the added advantage of providing employment and training opportunities for some members of the Baryulgil/Malabugilmah communities.

2.29 The Commonwealth has in total expended $3 343 578.00 on the two communities since 1977. The expenditure, based on information provided by the Department of Aboriginal Affairs and the Aboriginal Development Commission, is as follows:

GRANTS-IN-AID CASH RELEASES — BARYULGIL AND MALABUGILMAH COMMUNITIES — 1977 TO 1/5/84[55]

1977/78		$
BARYULGIL SQUARE CO-OPERATIVE		
	Sealing of Asbestos tailings	9 032
1979/80		
BARYULGIL SQUARE CO-OPERATIVE		
Town Management and Public Utilities	Feasibility study sewerage and water	10 165
Town Management and Public Utilities	Replace vehicle plus operating costs	9 836
COLLUM COLLUM		
ENTERPRISE	Operating Costs	55 180
1980/81		
MALABUGILMAH ABORIGINAL CORPORATION		
HOUSING	Construct Houses	323 652
Community Management and Services	Purchase Land connect services	118 120
1981/82		
MALABUGILMAH ABORIGINAL CORPORATION		
Community Management and Services	Purchase Truck operating costs site works, roadworks	117 100
Aboriginal Public Health Program	Sewerage, water, power	495 000
1982/83		
MALABUGILMAH ABORIGINAL CORPORATION		
Aboriginal Public Health Improvement Program	Sewerage, water, power	400 000
Community Management and Services	Site and roadworks fire control, slasher	69 853
BARYULGIL SQUARE CO-OPERATIVE		
Community Management and Services	Sewerage pump, electricity	14 097

1983/84		
MALABUGILMAH ABORIGINAL CORPORATION		
EDUCATION	Pre School	3 215
SOCIAL SUPPORT	Operating Costs	4 600
Community Management and Services	Site and Road Works	39 000
Community Management and Services	Additional Road Works, Design Playing fields, Sewerage and water	35 000
Legal Aid	Employment of Liaison Officer re Asbestos Inquiry	11 684
COLLUM COLLUM		
EMPLOYMENT	Establish sawmill Capital operating costs	61 675
EMPLOYMENT	Salary: Fencing Supervisor	7 205
		$1 784 414

2.30 In addition the Aboriginal Development Commission has expended the following amounts:

Baryulgil Square Co-operative

	Grant	*Loan*
1980/81	$66 500 (ent.)	
1981/82	$50 445 (housing)	
1982/83		$8 600 (Ent)

Collum Collum Aboriginal Corporation

	Grant	*Loan*
1981/82	$100 000 (ent)	
1982/83	$150 000 (ent)	$22 600 (ent)
1983/84		$56 760 (ent)
1984/85		$69 200 (ent — not yet disbursed)

Malabugilmah Aboriginal Corporation

	Grant
1981/82	$209 059 (housing)
1982/83	$330 000 (housing)
1983/84	$251 000 (housing)
1984/85	$245 000 (housing)

BARYULGIL SCHOOL

2.31 Tailings from the Baryulgil mine were used as a surfacing material in the Baryulgil School. The Aboriginal Legal Service submission states that:

> Ex-pupils have described . . . such pastimes as playing marbles in asbestos dust and the use of the tailings in the jumping pits. The foundations of the present-day Baryulgil School are believed to incorporate large amounts of tailings.[56]

2.32 The evidence gives no indication when the practice of using tailings at the school commenced, but it appears to have ceased in 1977. Mr Lawrence of the Aboriginal Legal Service stated:

> The practice of spreading tailings about the reserve ceased in 1977. Those tailings that were already in the reserve were, to an extent, covered over. Those in the local school were covered over.[57]

2.33 At the same time, steps were commenced to eliminate or diminish any risk posed by the tailings already in the school yard. Among documents provided to the Committee by the Department of Aboriginal Affairs and incorporated in the Transcript of Evidence is a letter of 28 November 1977 from the Secretary of the Health Commission of New South Wales to the Regional Director of the Department which stated: 'The Department of Education has now cleared all asbestos from the school grounds . . .'[58] A file note of the Department, dated 9 December 1977 similarly incorporated, refers to an interview on ABC television with Dr John Ward, O.I.C. Aboriginal Health Section of the Health Commission, in which Dr Ward stated that:

> . . . the State Education Department had acted promptly to cover the school playground with new fill . . .[59]

2.34 Also provided by the Department of Aboriginal Affairs was a letter of 22 February 1980 to the Acting Regional Director-Eastern from the Director of Education which stated:

> I would like to point out that the present brick school buildings at Baryulgil have recently been completed (1977) at a cost of $177 000. The N.S.W. Department of Public Works, which is the constructing authority for my Department, has advised that any asbestos tailings on the school site at the time of construction of the new school buildings were covered by a minimum of 100 mm of topsoil and grassed or, in the case of the access road, has been covered by a bituminous seal.[60]

2.35 The Department of Aboriginal Affairs referred to an arrangement between the then Minister, Senator Baume, and the then N.S.W. Minister for Education, Mr Landa:

> to have urgent investigations made by appropriate State authorities to determine what could be done to protect the health of the children at Baryulgil School. Mr Landa wrote to Senator Baume in March 1980, indicating that the great majority of the parents had indicated that they wanted their children to continue attending the existing school, even if they decided to move to Malabugilmah. Consequently no action was taken to establish an additional school.[61]

2.36 In April 1980, the State Pollution Control Commission expressed themselves as satisfied that the tailings used at the school 'are not now likely to cause any problems.'[62] That comment was quoted in a geological study of the Area carried out in October 1980 at the request of the Department of Aboriginal Affairs.[63] However, the geologist reported that 'Areas near the Community Hall and the Public School are contaminated with asbestos', and said, of the S.P.C.C.'s expression of satisfaction:

> It is already evident that such precautions were inadequate. This emphasises how difficult it would be to predict whether any proposed scheme to bury the asbestos wastes in the Baryulgil area will permanently solve the pollution problem.[64]

2.37 On 17 October 1980, Mr Donnelly, the Department of Aboriginal Affairs' Northern Region Area Officer, wrote to the Region's Director of Education about the decision of the Copmanhurst Shire Council to delay approval of the development application for the Malabugilmah site. Council was seeking further medical advice because of the fact that the tailings at the school had resurfaced.[65]

2.38 In late November 1980, the Minister, Senator Baume, visited Baryulgil. As a result, on 2 December 1980, he wrote to the N.S.W. Education Minister, Mr Landa, expressing concern over possible health risks at the school, and indicated an intention to

ask the NH & MRC's asbestosis sub-committee to report.[66] These matters were also mentioned in a press release issued by Senator Baume on 10 December 1980.[67]

2.39 On 15 January 1981, the Deputy Regional Director of the N.S.W. Health Commission inspected the Baryulgil school site. He reported that 'patches of ground containing asbestos tailings are clearly visible . . .'[68] The next day, he visited the Deputy Regional Director of Education, and expressed to that official the Commission's view that a bituminous surface rather than top-dressing and turfing was required. The Deputy Regional Director of Education agreed to be guided by the Health Commission's advice.[69] On 6 February 1981, a Department of Aboriginal Affairs file note referred to the following work having been carried out at the school:

— 4 inches of heavy loam . . . deposited all over the playground;

— grass seeds . . . placed in the loam;

— bitumen . . . laid in the spots where asbestos exposure is worst.[70]

2.40 On 24 February 1981, Mr A.T. Jones, Officer in Charge of the Industrial Hygiene Branch of the Health Commission, and Mr K. McCosker, Regional Health Inspector, made a further investigation of the Baryulgil area. They reported:

> *School*
>
> The play area immediately at the rear of the school building, extending across about twenty metres and out from the building about forty metres had been covered with a layer of soil and then asphalted by the Department of Public Works. This is the principal play area, and an area where mine waste has been used to fill depressions. There was no sign of uncovered waste. The nearby net ball court had been similarly treated, and no waste was visible. Soil to a depth of fifteen centimetres had been placed on a further area of the rear school yard and seeded. This extended out about sixty metres to the football field. Grass was growing well and was being sown at the time of inspection. No asbestos tailings were visible.
>
> Sampling for airborne asbestos fibre was carried out on a lean to roof at the toilets, on the rear of the school building, both adjacent to the play area, and near the mound on the western side of the yard. The sampling period covered before school recess and lunch time play, and mowing.
>
> Results of these tests were nil fibres per millilitre.
>
> Covering of the yard with soil and grassing, and sealing with asphalt in the heavy play areas has eliminated exposed tailings and no exposure to asbestos fibre released from them by foot traffic is now anticipated. Provided these areas are maintained in this condition there should be no exposure to fibres from this source in future, and thus no hazard to children or staff.[71]

A copy of their Report was sent to the Department of Aboriginal Affairs by the Public Health Division of the Commonwealth Department of Health. The accompanying letter stated:

> . . . it would appear that the question of the existence of health hazards to schoolchildren has now been resolved. It is suggested that no further action should be taken.[72]

The Health Commission itself commented on the 24 February inspection in a letter to the Department of Aboriginal Affairs on 23 March 1981:

> An inspection was made on 24 February 1981 at Baryulgil by the Officer in Charge, Industrial Hygiene Branch, Division of Occupation Health and Radiation Control in relation to possible exposures to airborne asbestos fibres from the use of mine waste as fill in various areas in the school and village. The inspection included the school grounds, 'The Square' and the old mine area and tailings dump. Tests for asbestos in air were carried out in the school yard and 'The Square'. Substantial rainfall had occurred in the area up to the day preceding this inspection.[73]

The letter then quoted the final paragraphs of the Jones and McCosker report.

2.41 However, the Department of Aboriginal Affairs submission expressed concern about the situation at the school. It stated:

> DAA's Area Officer has had discussions with Regional staff of the New South Wales Department of Education about the possible continuing health risks for children attending the school. Already the New South Wales Department of Education has tried to reduce the asbestos exposure at the school. One way of resolving this matter may be for the school to be closed altogether. This action would almost certainly be strongly opposed by most families (Aboriginal and non-Aboriginal) serviced by the school. A more desirable action would be for the school to be relocated to Malabugilmah which is safe from asbestos contamination yet relatively close to the existing school. DAA strongly supports the retention of a school in the area because of our continuing endeavours to improve Aboriginal education.[74]

2.42 At the present moment, there are 34 children attending Baryulgil School of whom 19 are Aboriginal children. Three of the Aboriginal children are from Baryulgil Square and 16 are from Malabugilmah.[75]

POPULATION OF BARYULGIL SQUARE AND MALABUGILMAH

2.43 The population of Baryulgil Square and Malabugilmah was reported by the Department of Aboriginal Affairs as 126 people as at 31 August 1984. The population comprises 57 women and 69 men ranging in age from two years to the oldest resident who is 76. Twenty members of the community are in infancy, 39 of primary school age and there are 27 young adults living at the two communities. The mature adult population is 40 people.

2.44 The Committee received, separately, information concerning the residents at Baryulgil Square. As at 30 June, it was reported that there were 37 residents grouped into nine households. Eight of these were school children and five were children not yet at school. It is interesting to compare this information with that collected earlier in the year reporting the population to be 28 people living in six households. There appears to have been significant inward migration (nine people) now living in nine households (they are living in houses that were previously abandoned). It is rumoured that a further six families intend returning to the Square in 1984/85. This inward migration to Baryulgil could be part of a trend recently discerned for Aboriginal people residing in urban centres to return to their rural communities of origin.

EMPLOYMENT

2.45 In the two communities two people are permanently employed, 10 people are employed part-time and six people are employed for a temporary period under the Community Employment Program (CEP). The number unemployed is 36, of whom 25 are on Unemployment Benefit. Twenty-two members of the community are receiving supporting parents benefits and two receive the old age pension. It is interesting to note that only five members of the community are in receipt of invalid pension. Only five of the persons in employment resided at the Square.[76]

ENDNOTES

1 Transcript of Evidence, p. 2878.
2 Transcript of Evidence, *ibid.*
3 Transcript of Evidence, *ibid.*
4 'the oldest resident of Baryulgil' — Transcript of Evidence, *ibid.*
5 Transcript of Evidence, p. 2879.

6 Submission of Vivienne Abraham, Transcript of Evidence, p. 2392.
7 Aboriginal Legal Service Submission, Transcript of Evidence, p. 2879; Submission of Vivienne Abraham, Transcript of Evidence, p. 2392.
8 Transcript of Evidence, *ibid.*
9 Transcript of Evidence, *ibid.*
10 Aboriginal Legal Service Submission, Transcript of Evidence, p. 2879.
11 Submission of Vivienne Abraham, Transcript of Evidence, p. 2392.
12 Aboriginal Legal Service Submission, Transcript of Evidence, p. 2879.
13 Transcript of Evidence, *ibid.*
14 Hardie Trading (Services) Pty Ltd Submission, Transcript of Evidence, p. 2635.
15 Transcript of Evidence, *ibid.*
16 Aboriginal Legal Service Submission, Transcript of Evidence, p. 2280; See also Submission of Vivienne Abraham, Transcript of Evidence, p. 2392, paragraph 2.5.
17 Aboriginal Legal Service Submission, Transcript of Evidence, p. 2280.
18 Department of Aboriginal Affairs Submission, Transcript of Evidence, p. 1799.
19 Transcript of Evidence, *ibid.*
20 Transcript of Evidence, *ibid.*
21 Transcript of Evidence, p. 1800.
22 Transcript of Evidence, p. 1801.
23 Transcript of Evidence, p. 1812.
24 Aboriginal Legal Service Submission, Transcript of Evidence, p. 2907.
25 Transcript of Evidence, pp. 166–7.
26 Aboriginal Legal Service Submission, Transcript of Evidence, p. 2882.
27 Transcript of Evidence, p. 1800.
28 Transcript of Evidence, p. 1957.
29 Transcript of Evidence, p. 2119.
30 Transcript of Evidence, pp. 237 and 242–3.
31 Transcript of Evidence, pp. 2122–3.
32 Report of Dr K.I. Basden, submitted by the Aboriginal Legal Service and incorporated into the Records of the Inquiry as Exhibit No. 20.
33 Aboriginal Legal Service Submission, Transcript of Evidence, p. 2883.
34 Transcript of Evidence, p. 236.
35 Transcript of Evidence, p. 2393.
36 Transcript of Evidence, p. 2394.
37 Transcript of Evidence, *ibid.*
38 Transcript of Evidence, p. 2399.
39 Transcript of Evidence, pp. 1800–1801.
40 Transcript of Evidence, p. 1800.
41 Transcript of Evidence, p. 1804.
42 Transcript of Evidence, pp. 1804–5.
43 Transcript of Evidence, p. 1805.
44 Transcript of Evidence, p. 1808.
45 Transcript of Evidence, p. 1800.
46 Transcript of Evidence, p. 1852.
47 Transcript of Evidence, p. 2092.
48 Following the disbanding of the A.L.F.C. Transcript of Evidence, p. 2092.
49 *Ibid.* See also the evidence of Miss Vivienne Abraham, *ibid.* pp. 2405–2409.
50 Transcript of Evidence, p. 2094.
51 Transcript of Evidence, *ibid.*
52 Transcript of Evidence, p. 2107.
53 Transcript of Evidence, p. 2095.
54 Transcript of Evidence, p. 2097.
55 Information supplied by the Department of Aboriginal Affairs, 31 August 1984.

56 Transcript of Evidence, p. 2908.
57 Transcript of Evidence, p. 1468.
58 Transcript of Evidence, p. 1855.
59 Transcript of Evidence, p. 1856.
60 Transcript of Evidence, p. 1912.
61 Transcript of Evidence, pp. 1808–9.
62 Transcript of Evidence, p. 1807.
63 Transcript of Evidence, p. 1805.
64 Transcript of Evidence, p. 1807.
65 Transcript of Evidence, p. 1964.
66 Transcript of Evidence, p. 2033. The N.H. and M.R.C. study was eventually not carried out because that body believed it would merely duplicate an investigation being carried out by the N.S.W. Health Commission.
67 Transcript of Evidence, p. 1818.
68 Transcript of Evidence, p. 884.
69 Transcript of Evidence, *ibid.*
70 Transcript of Evidence, p. 2044.
71 Transcript of Evidence, pp. 2056–7.
72 Transcript of Evidence, p. 2055.
73 Transcript of Evidence, p. 2050.
74 Transcript of Evidence, p. 1810.
75 Transcript of Evidence, p. 1852.
76 The information contained in paragraphs 2.44 to 2.46 was provided to the Committee, under cover of a letter to the Committee from the Department of Aboriginal Affairs dated 31 August 1984.

Chapter 3
Asbestos as a health hazard

3.1 Asbestos is the generic term for a group of naturally occurring fibrous silicate minerals with a crystalline structure. There are several members of this group, the most important being crocidolite (blue asbestos) chrysotile (white asbestos) and amosite (brown asbestos). In Australia, about 85% of asbestos used is chrysotile, the remaining 15% being amosite.[1] In the past, significant quantities of crocidolite were also mined (in the Hammersly Ranges in Western Australia), but mining has ceased and the continued use of crocidolite has in most cases been prohibited.

3.2 The physical and chemical properties of asbestos are such that it is highly resistant to heat and acid, has high tensile strength, forms effective electrical insulation, and is effective in muffling sound. The fibres can be spun and processed to make boards or pliable sheeting that can be moulded around objects such as pipes. Alternately, a powdered form can be mixed with paste and applied damp as an insulation. Asbestos is estimated to have over 2000 different uses, including friction-materials, textiles, lagging of pipes and other insulation products, sound-proofing, and building materials.

3.3 The main danger to health occurs when asbestos dust is inhaled. This happens in many circumstances, the most important of which include the mining and milling processes, the manufacture of asbestos products, spinning the fibre, lagging pipes and boilers, and the grinding, sawing, drilling, of asbestos-containing materials where the asbestos is treated or bonded into the material. The application of insulation materials by spraying and the removal of old asbestos insulation are also important sources of exposure.

ASBESTOS-INDUCED DISEASE

3.4 As a result of exposure to asbestos dust, workers run a risk of developing several serious and sometimes fatal diseases, specifically asbestosis, lung cancer, pleural and peritoneal mesothelioma, and possibly cancer of the larynx and some gastrointestinal cancers.

3.5 Different types of asbestos have different characteristics. For example chrysotile, the only member of the serpentine group, has a fibre different from the amphibole group (which includes crocidolite and amosite) in that the basic fibre is tubular. This may influence its deposition in and clearance from the lungs and may help explain why some types of asbestos are more closely associated with particular diseases.

3.6 The risk of developing cancer varies with the type of asbestos fibre, the amount of asbestos fibre inhaled, and the time since exposure began. The risk of lung cancer associated with asbestos exposure is also influenced by tobacco smoke.[2]

3.7 The asbestos-related diseases are believed to be due to the physical nature of asbestos fibres rather than to their chemical properties. Individual asbestos fibres are microscopic, fine, short fibres that once lodged in the body, may remain there permanently. The main route of entry into the body is inhalation, though it is also possible to drink asbestos fibres in water and beverages such as wine and spirits, and to eat them in food.[3] Detailed analyses of the health effects of asbestos exposure have been published elsewhere and are readily available.[4] Only the essential facts need be repeated here.

Asbestosis

3.8 Asbestosis may result from the inhalation, usually over a period of years, of substantial amounts of asbestos dust. The mere accumulation of dust in the lungs is not considered in itself to be a disease. Rather, asbestosis occurs when inhaled particles lodge in the lung tissue causing fibrosis, which is the laying down of scar tissue in the lung.

3.9 Once this process starts, it is irreversible, progressive and incurable. Progression may continue after exposure to asbestos has ceased. As the fibrosis becomes more extensive the affected part of the lung becomes shrunken and scarred so that breathing becomes difficult and exchange of oxygen between the blood and inhaled air is severely impaired. Those suffering from asbestosis experience increasing breathlessness and become progressively more disabled. Strain on the heart can lead to death from heart failure.

3.10 Asbestosis may be difficult to diagnose because its onset is gradual, and because the same symptoms occur in other diseases which may be confused with asbestosis. Minor changes in x-ray pictures attributable to asbestos may exist for many years without symptoms or progression.[5]

Lung cancer

3.11 Numerous reports have implicated asbestos as a cause of lung cancer and high rates of lung cancer have been observed in asbestos workers exposed to all commercial asbestos types. Asbestos-exposed workers who smoke are particularly prone to develop lung cancer, and the best evidence is that the effect of smoking is to multiply the effect of asbestos exposure in producing lung cancer. Some studies have indicated that a majority of heavy-smoking, highly exposed asbestos workers may eventually develop the disease.[6] If these cancers are detected in the early stages, they may be removed, but the outcome is usually poor.

Mesothelioma

3.12 This is a cancer of the pleura (the outer lining of the lung) or the peritoneum (the lining of the abdominal cavity). In the absence of asbestos exposure, mesothelioma is rare, having an estimated incidence of one per million in the general population. Where mesothelioma does occur, the majority of cases can usually be traced back to exposure to asbestos or some other fibrous mineral.[7]

3.13 Studies have shown that the incidence of mesothelioma increases with increasing exposure to asbestos.[8] Mesothelioma can be induced by relatively short term exposure to high concentrations, or by smaller intermittant doses over a long period. Several studies have also documented an association between mesothelioma and apparently low levels of asbestos exposure for relatively brief periods in the remote past. Although this relationship has not been established conclusively,[9] it seems clear that there is a dose-response relationship[10] and that the concept of a threshold dose is not applicable to mesothelioma. Mesothelioma rarely occurs in under 15 years from first exposure to asbestos and most cases occur 20 to 50 years after first exposure.

3.14 The risk of mesothelioma appears to be greatest with crocidolite, less with amosite and less again with chrysotile.[11] Chrysotile mining and milling, while related to a significantly increased risk of death from lung cancer and asbestosis, have not been associated with a high mesothelioma risk. Nicholson has suggested that these differences in risk may be accounted for in part at least by the differences in fibre size distributions in different work environments rather than fibre type.[12]

3.15 There is no effective treatment for mesothelioma, which is invariably fatal, generally within a year of diagnosis.

Pleural plaques

3.16 Without any direct relationship to the appearance of scar tissue within the lung, patches of fibrous thickening may appear on the pleural membrane which lines the space in the chest occupied by the lungs. Such patches are known as 'pleural plaques'. They commonly occur before fibrosis, but may appear after fibrosis is well established. They may also appear in the absence of any other chest signs resulting from asbestos inhalation. In some countries they are held to be a sign of asbestos exposure. They have minimal effect on lung function and their presence may be associated with other forms of asbestos-related disease. Pleural plaques may never be diagnosed in life, and may not affect general health in any way.[13]

Gastrointestinal cancers

3.17 This refers to tumours occurring in the tract or 'tube' that extends from the mouth to the anus. Several studies have suggested a possible increased risk of these tumours in occupationally exposed asbestos workers. The suggested increase is up to two to three times the otherwise expected incidence but the relationship is not yet clearly established.

THE TIME FACTOR

3.18 All asbestos related diseases mentioned above have in common the existence of a delay or lag-period, usually of many years, between first exposure and onset of symptoms. Such disease can appear and progress after cessation of exposure.

3.19 Disease and death due to asbestos exposure usually does not become significant, in terms of number of cases, until 25 or 30 years or more from first exposure. Lung cancer is an important cause of death after 25 years, and mesothelioma and asbestosis after 30 or 35 years.[14] Asbestos-related deaths are rare in less than ten years from first exposure.

3.20 There is an inverse relationship between the latent period and the cumulative exposure to asbestos; the greater the cumulative exposure, the shorter the latent period. This trend is modified considerably by individual susceptibility.

3.21 The long latent period of asbestos disease has a number of serious implications of which the most important are that the disease may occur many years after the worker has left the relevant job; cases of the disease occurring at present do not relate to current conditions of work; and a period of several decades must elapse before it is possible to give a final answer about the appearance or control of an asbestos-related hazard. The latent period is consequently a major problem in establishing the work-related nature of the health problems (workers often forget their initial exposure to asbestos after so many years), and in establishing and proving the indirect effect of asbestos exposure in families of asbestos workers.

ENVIRONMENTAL ASBESTOS DISEASE

3.22 While asbestosis is almost always occupational in origin[15] (the result of mining, milling, manufacturing, applying, removing or transporting asbestos fibre) this is not the case with certain of the asbestos cancers.[16]

3.23 Asbestos-related disease in persons who had not been directly exposed at the workplace has been known since 1960. In that year Wagner *et al*[17] published a review of 47 cases of mesothelioma found in the Northwest Cape Province of South Africa in the previous five years. Approximately half the cases described were in individuals who had, decades before, simply lived or worked near an area of crocidolite mining. The hazard

from environmental asbestos exposure was further documented in the findings of Newhouse and Thomson,[18] who showed that mesothelioma could occur among individuals whose potential asbestos exposure consisted of having resided near an asbestos factory or in the household of an asbestos worker. Twenty of 76 cases from the files of the London Hospital were the result of such exposures. Similarly another study of families of employees of an asbestos factory in New Jersey showed 35% of 678 family contacts of former asbestos workers had radiological abnormalities characteristic of asbestos exposure.[19] The source of indirect domestic exposure is presumed to be the dust brought home in the worker's overalls, and certainly air concentrations of asbestos in homes of asbestos workers have been recorded as ranging from 100–500 ng/m^3 (ng is a thousand millionth of a gram) of asbestos figures. Data do not exist on the air concentrations of asbestos present in the circumstances that have led to environmental asbestos disease, although crocidolite, amosite, and chrysotile have each been implicated as causative agents.[20]

3.24 The surprisingly high prevalence of asbestos bodies (as evidence of exposure) in routine autopsies indicates an environmental exposure for the residents of most of the larger cities of the world; however, the amounts in the general atmosphere are small, and these autopsy findings should probably be regarded more as an index of exposure rather than of disease potential.[21] The Advisory Committee report that followed the Lyon conference concluded that 'there is at present no evidence of lung damage by asbestos to the general public,' and 'the amount of asbestos in the lungs of members of the general public is very small compared to those occupationally exposed.'[22]

THE INCIDENCE OF ASBESTOS-RELATED DISEASE

3.25 Although there are now many data on the health hazards of asbestos, there is little accurate information predicting the amount of asbestos related disease to expect, in a community that has had exposure to asbestos. This is due to lack of information of fibre exposure levels and the duration of exposure.

3.26 So far as asbestosis is concerned, the British Advisory Committee on Asbestos, reporting in 1979, concluded that exposure to one fibre of chrysotile per ml of air each working day over a period of 50 years will cause an increased mortality rate of 0.02 to 1.25 per cent.[23] This prediction is based on the results of only three surveys — two North American, one British — which provided adequate/dose response data. However, even mortality rates based on these results have their problems, as that report acknowledges.[24]

3.27 As far as the asbestos cancers are concerned, estimates of mortality vary considerably. Calculations by U.S. health agencies[25] suggest that 20% of all workers heavily exposed to asbestos die of lung cancer, 8% to 10% of stomach cancer and cancer of the intestines and 7% to 10% of pleural or peritoneal mesothelioma.[26] A more recent U.S. Occupational Safety and Health Administration study predicts that a reduction in the permissible exposure limit (PEL) for asbestos from 2 fibres per cc (f/cc) of air to 0.5f/cc would reduce the risk of asbestos-related cancers among exposed workers from 64 per 1000 to 17 per 1000, a 73% reduction in risk. However, the Quantitive Risk Assessment for Asbestos Related Cancers prepared in conjunction with the Mt. Sinai School of Medicine cautions that there are some statistical uncertainties due to the small numbers involved. Among other conclusions drawn from a survey of studies[27] of asbestos-induced pleural or peritoneal mesothelioma, lung and gastrointestinal cancer was an estimate that even one year of exposure at age 20 to asbestos at 2 f/cc may result in a total cancer risk as high as 345 per 100 000 workers. Using a 20-year exposure to asbestos, the study suggests an excess cancer mortality of 4392 deaths per 100 000 workers.[28]

3.28 In relation specifically to lung cancer, the evidence is that an asbestos worker who has never smoked is five times more likely to die of lung cancer than is a non-smoker who does not work with asbestos. An asbestos worker who smokes is ten times more likely to die of lung cancer than is an asbestos worker who does not smoke, but fifty three times more likely to die from lung cancer than is a worker who neither smokes nor works with asbestos. Once smoking stops, the relative risk becomes less with every year.[29]

3.29 Finally, there is the comprehensive survey contained in the *Criteria Document for Swedish Occupational Standards: Asbestos and Inorganic Fibres.*[30] This reviewed detailed scientific research estimating the doses of asbestos exposure and the resultant mortality of asbestos workers. This document concluded from the study of nine mortality studies that:

- Six recent epidemiological studies demonstrate that exposure over forty years to asbestos concentrations allowed by [then] current standards (2 fibres/ml of air) . . . may lead to *at least* a doubling of the risk of lung cancer and an increase in total mortality by 10%.
- Three of these studies suggest that such increased mortality may result from exposures as low as 0.5 fibres/ml for 40 years.
- At least four epidemiological studies of asbestos workers demonstrate a linear dose-response relationship for lung cancer and other asbestos disease with no evidence of a threshold below which excess disease does not appear.

3.30 Two of the findings require further comment. First, there is now widespread agreement that there is a linear dose-response relationship between asbestos exposure and asbestos disease. This relationship means that the greater the exposure, the greater the mortality.[31]

3.31 The second and related point is that there is no evidence of a threshold below which excess disease does not occur. There is some uncertainty as to whether this is correct in the case of asbestosis[32] but it almost certainly holds true for the carcinogenic properties of asbestos.[33] This is now recognised by the world's leading health authorities who have acknowledged that:

> At present it is not possible to assess whether there is a level of exposure in humans below which an increased risk of cancer will not occur.[34]

and that:

> Data to date provide no evidence for the existence of a threshold level. Virtually all levels of asbestos exposure studied to date demonstrated an excess of asbestos-related disease.[35]

This means that there is *no* safe level of exposure to asbestos as far as cancers are concerned and that even small concentrations of asbestos dust are associated with an increased risk of cancer.[36]

KNOWLEDGE OF ASBESTOS HAZARDS

3.32 The relationship between lung disease and asbestos exposure was first recognised early this century. In 1899, within twenty years of the first production of asbestos yarn in the United Kingdom the first fatal case of asbestosis was diagnosed. This was noted in 1900 by Montague-Murray and reported seven years later.[37]

3.33 In 1910, Dr Collis of the United Kingdom Factory Inspectorate reported that five deaths of persons suffering from phthisis (asbestosis) had occurred in five years among a staff of under forty workers at a factory where asbestos was woven. By 1912, Professor Beattie of Sheffield University, had established that inhalation of asbestos dust caused lung fibrosis (asbestosis) in guinea pigs.

3.34 Insurance companies quite early became aware of the health effects of exposure to asbestos dust. The companies readily saw that asbestos workers were a bad insurance risk, and in 1918 it was reported that:

> in the practice of American and Canadian insurance companies asbestos workers are generally declined on account of the assumed health-injurious conditions of the industry.[38]

However, we note that this practice has not in fact been a policy of insurance companies in subsequent years.

3.35 During the 1920s asbestosis became recognised as an entity distinct from other fibrous diseases of the lung. W.E. Cooke, in a famous paper in 1924, reported his post-mortem examination of an asbestos worker in whose fibrosed lungs Cooke found 'particles of mineral matter'.[39] A number of further cases were reported, the best documented being that of Seiler in 1928.[40] In the United Kingdom, as a result of these reports, the Factory Department of the Home Office undertook an investigation into the effects of asbestos dust on the lungs. The full report, by Merewether and Price,[41] showed that 95 out of 363 asbestos textile workers examined had definite pulmonary fibrosis (asbestosis) due to asbestos dust.

3.36 They also found a correlation between the incidence of the disease and the duration and intensity of dust exposure.[42] Merewether also made a radiological survey which demonstrated signs of diffuse fibrosis in a number of the cases. The report suggested that with high exposure to dust, fibrosis might develop in 7 to 9 years whereas at lower dust concentrations, the maturation period of fibrosis might be 15 to 25 years. The report reviewed the dust concentrations in various textile processes and recommended methods of dust suppression. These measures formed the basis of the 1931 Asbestos Regulations which set out specific precautions to be taken in asbestos industries, to protect workers from the dust. For example, asbestos was to be prevented from escaping into the air (by the use of exhaust ducts), sacks were to be impermeable to dust, and they were not to be beaten by hand. The Merewether report also led to asbestosis being recognised as a compensable disease.

3.37 In 1933 Merewether reported the results of a study of 1517 exposed workers, again finding an incidence of asbestosis that rose rapidly after 10 years to 50.3% after 20 years.[43] One hundred cases of asbestosis were reviewed by Wood and Gloyne in the Lancet in 1934,[44] and with this large number of cases, many papers appeared on the pathology and radiology of the condition.[45]

3.38 Also in the 1930s and perhaps even before that time, the United States asbestos industry and its insurers were settling claims for compensation resulting from asbestos diseases.[46]

3.39 Reports from the U.S.A. indicate that in 1933 the Johns-Manville Company's boards of directors agreed to the settlement of eleven asbestosis claims for $35 000 with a convenant from the attorney not to bring further suits,[47] and that two further suits were settled in 1937 by the insurers of the asbestos industry.[48]

3.40 As the evidence mounted on the dangers of asbestos, so steps began to be taken to protect workers through compensation legislation. In 1937 the States of Pennsylvania and Indiana enacted Workman's Compensation Laws covering the disease of asbestosis. In subsequent years, throughout the 1930s and 40s, further compensation claims for asbestosis were settled by the insurance companies. Other States in the U.S.A. also enacted Workman's Compensation Laws covering asbestosis.

3.41 By 1940 there were no longer any doubts that asbestos caused a severe and often fatal fibrosis of the lungs. It was known that asbestosis became more likely with longer exposure to asbestos.[49] It seemd probable that high concentrations were more dangerous

than low — the British regulations, now nearly a decade old, clearly assumed this. In 1938 the American Conference of Government Industrial Hygenists (ACGIH) recommended a level of 5 million particles of dust/cubic foot (approx. 176 fibres per c.c.) as a maximum.[50] This soon became an unofficial standard. Although in the light of present knowledge, the studies on which the standard was based were inadequate, this was clearly not appreciated at the time. Subsequent evidence, in the mid and late 1960s, was to suggest the need for much stricter controls, and led to new regulations in 1969 in the United Kingdom, but it was only well into the 1970s in Australia, that the ACGIH standard was relinquished, and that new and tighter statutory controls were imposed.[51]

3.42 In the mid 1930s a relationship between asbestos and lung cancer was first suspected.[52] Further reports of such cancer followed and by the early 1940s a number of American researchers were linking asbestos with lung cancer. In 1942 Heuper[53] listed asbestos as a carcinogen. He surveyed case reports and called for the use of substitute products. In the same year, Holleb and Angirst reported ten cases of asbestosis and lung cancer in asbestos insulators.[54]

3.43 Evidence continued to mount that asbestos was a cancer-causing agent, but it was not until 1949, with the publication of the 1949 Annual Report of the Chief Inspector of Factories, that the incidence of lung cancer was related to a sizeable group of asbestos deaths. Even this evidence appears to have caused little concern,[55] and it was only with Doll's famous paper in 1955, that the link was generally recognised.[56] Doll reported on all the coroner's necropies since 1935, on persons known to have been employed in a large asbestos works, and showed that asbestos workers had a death rate for lung cancer of ten times that of the general population.

3.44 Since this time a number of further studies investigated this relationship.[57] During the 1960s Selikoff *et al.* published retrospective studies of the health records of very large numbers of asbestos insulation workers.[58] They confirmed Merewether's and Doll's finding of an increased risk of lung cancer, and began to provide more precise estimates of the magnitude of this risk. They helped reveal the time course of asbestos-related disease, and the association between asbestos exposure, smoking and lung cancer.[59] By the early 1960's there were data specific to chrysotile miners showing an excess of lung cancers, especially at higher exposures.[60] There remained uncertainty about the risk of lung cancer with low exposures.[61] Contemporary evidence on this issue has already been discussed.

3.45 Meanwhile various groups of workers had been paying attention to the effects of asbestos on the pleura or lining of the lungs. As long ago as 1931, Klemperer and Robin published an account of five primary neoplasms of the pleura,[62] although they did not clearly establish the relationship with asbestos exposure.[63] In 1960, however, Wagner, Sleggs, and Marchand in South Africa reported thirty-three cases of mesothelioma of the pleura, thirty-two in association with exposure to crocidolite.[64] Soon after, Enticknap and Smither[65] described peritoneal mesothelioma occurring with asbestos exposure.

3.46 Wagner went on to demonstrate the experimental development of pleural mesotheliomatous tumours by the intrapleural injection both of chrysotile and of crocidolite (1962). At the International Congress on Occupational Health in 1963, he was able to report on more than 120 cases since 1956. More than half of the cases had never worked in the asbestos industry but lived in the vicinity of mines and mills, and the importance of neighbourhood exposure was thereby established.[66]

3.47 By the early 1970s there was some evidence of an increased risk of malignancies other than lung cancer, and pleural and peritoneal mesothelioma. The most suggestive data concerned gastrointestinal malignancies.[67] More recent studies have confirmed these findings and have found excess risk of cancers at a number of other sites.[68]

3.48 With hindsight, evidence of many of the hazards of asbestos had been available for some considerable time. In the case of asbestosis, in the early 1930s, with lung cancer, by 1955, with mesothelioma, by the early 1960's. However, as Selikoff and Lee have pointed out, the situation in the 1960's was that much (but by no means all) of the evidence:

> rested on scattered reports of small numbers of cases, and the cases themselves suffered from being either selected or simply those that happened to come to the attention of the reporter. The population base from which the cases came was seldom mentioned. The significance of pleural changes and the occurrence of mesothelioma in persons without a distinct history of exposure remained in considerable doubt. The idea that asbestos could be at least a cofactor in the production of bronchogenic carcinoma was far from fully accepted. That parenchymal asbestosis was very likely to occur in those who had been exposed to heavy dosage in the early years of the industry was clear enough, but what effect environmental controls that had been introduced in the 1930's might have upon its future prevalence was not known. The possibility that quite low dosages might have grave consequences 30 or more years after first exposure was still unproven.[69]

Such evidence became available in the immediately succeeding years through better epidemiological techniques and an understanding of the long time interval required, following initial exposure, before definite conclusions could be drawn about the incidence of cancer.[70] The International Conference on the Biological Effects of Asbestos conducted by the New York Academy of Science in 1964 and the findings of the British Occupational Hygiene Society published in 1968,[71] were particularly crucial in suggesting that quite low levels of exposure might well constitute a health hazard. This evidence led ultimately to the strengthening of regulations and to further reductions in the levels of exposure to which we now turn.

ENDNOTES

1 NH & MRC. *Report on the Health Hazards of Asbestos,* Appendix 4, 1982, AGPS.

2 Ibid.

3 Asbestos gets into water from natural outcrops of asbestos, from tailings at asbestos mines, from asbestos wastes and, in minute amounts, from asbestos-cement roofs and water pipes. It gets into beverages and foods through the use of asbestos filters and from atmospheric fall-out.

4 NH & MRC (1982).
Becklake, MR, "State of the Art: Asbestos related Diseases of the Lung and Other Organs: Their Epidemiology and Implications for Clinical Practice". *American Review of Respiratory Diseases,* 114, 187–227 (1976).
Health and Safety Commission (U.K.) "Asbestos: Report of the Advisory Committee" (Vols. 1 & 2), HMSO (1979).
Miller AB, "Asbestos Fibre Dust and Gastro-intestinal Malignancies". Review of the Literature with Regard to Cause-Effect Relationships. *Journal of Chronic Diseases,* 31, 23–33 (1978).
Nicholson WJ, "Criteria Document for Swedish Occupational Standards: Asbestos and Inorganic Fibres" Arbete Och Halsa (1981:17).
Selikoff IJ and Lee DHK, "Asbestos and Disease", Academic Press, New York (1978).
Selikoff IJ and Hammond FC, "Health Hazards of Asbestos Exposure" Annals of New York Academy of Sciences, Vol. 330 (1979).
See generally *Report of the Royal Commission on Matters of Health and Safety Arising from the use of Asbestos in Ontario,* Ontario Ministry of Government Services 1984.

5 Health and Safety Commission (U.K.) (1979) Vol. 1, 49.

6 NH & MRC (1982) Appendix 4.

7 The rarer peritoneal mesothelioma is thought only to be associated with occupational exposure to asbestos.

8 NH & MRC (1982).

9 Becklake (1976) p. 211 and references contained therein.

10 See further p. 10 below.

11 For example, NH & MRC (1982) Appendix 4, Health and Safety Commission (U.K.) (1979).

12 Nicholson (1982). "The greatest percentage of longer and thicker fibres would occur in the work environment of miners and millers. When asbestos is used in manufacturing processes, it is broken apart as it is incorporated in finished products. During application or removal of insulation products, it is further manipulated and the fibres become reduced in length and diameter. As these smaller fibres can readily be carried to the periphery of the lung, penetrate the visceral pleura and lodge in the visceral or pariethal pleura, they may be of importance in the etiology of mesothelioma."

13 NH & MRC (1982) Appendix 4.

14 Selikoff IJ *et al:* "Mortality experience of asbestos insulation workers in the United States and Canada". Am. N.Y. Acad. Sci. 330 (1979) 91–116.

15 Even the exclusively occupational nature of asbestos is not beyond dispute, and it has been suggested that asbestosis *may* also have been caused by home exposure from dusty clothing at a time when there were no dust or hygiene controls concerning asbestos use. See Occupational Health and Safety Encyclopaedia 1983 187–197, International Labour Office, Geneva, Switzerland.

16 See generally Becklake (1976) 192, 193: Nicholson (1981) 65–67 and references therein.

17 Wagner, JC *et al:* Diffuse pleural mesothelioma and asbestos exposure in the north western Cape Province. Brit. J. Indus Med. 17 (1960) 260–271.

18 Newhouse, ML and Thomson, H: Mesothelioma of the pleura and peritoneum following exposure to asbestos in the London area. Brit. J. Indus. Med. 22 (1965) 261.

19 Anderson, HA *et al:* "Household contact asbestos neoplastic risk". An. N.Y. Acad. Sci. 271 (1976) 311–323.

20 Nicholson (1981) 193. See also Royal Commission on Use of Asbestos in Ontario (Report of the Royal Commission on Matters of Health and Safety Arising from the use of Asbestos in Ontaria, Ontario Ministry of Government Service 1984) pp. 8, 9, 99, 100, 285.

21 See Becklake (1976) 193.

22 Bogovski, Gilson, Timbrell and Wagner eds., Biological effects of asbestos. Proceedings of a working conference at IARC, Lyon, Oct 2–6, 1972, IARC Scientific Publications, No. 8, Lyon 1973, 1–341.

23 Health and Safety Commission U.K. (1979).

24 Much of the data in these surveys on asbestos concentration was obtained by measuring particle counts, a far less precise method than the normal practice of counting fibres.

25 'Estimates of the Fraction of Cancer in the United States Related to Occupational Factors' National Cancer Institute, National Institute of Environmental Health Services and National Institute of Occupational Safety and Health (1978).

26 This report has been severely criticised see Editorial *Lancet* 1238–40 (1978).

27 See also *Criteria* Document for Swedish Occupational Standards discussed below.

28 Summarised in C.C.H. *Industrial Safety Health and Welfare* (1984) at 48–011.3.

29 *Health Trends* 1981, Vol. 13.

30 Nicholson (1981).

31 See generally McDonald, JC *et al:* "Dust Exposure and Mortality in Chrysotile Mining 1910–75" Brit. J. Indus. Med. 37, 11–24 (1980); NH & MRC (1982) Appendix 4, and Nicholson (1981) 20. However, there is some evidence to suggest that the curve tends to flatten at higher dust concentrations but the British Advisory Committee on Asbestos preferred a linear model on the grounds that it would lead to an overestimate of the incidence of disease and was therefore more appropriate to the framing of statutory regulations for the control of airborne asbestos in industry.

32 See for example Health and Safety Commission U.K., 1979, where the Advisory Committee on Asbestos suggested that "there may be a safe level below which asbestosis does not occur." Even if there *is* no threshold dose below which asbestosis will not occur, it is only the rare, highly susceptible individual who will develop the disease with trivial exposures.

33 Cf. NH & MRC (1982) 8.

34 IARC Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Men. 14. 'Asbestos'. Lyon, International Agency for Research on Cancer (1977).

35 National Institute for Occupational Safety and Health (U.S.A.).

36 Nicholson, WJ: Asbestos Health Effects Update. Environ. Sc. Lab. Mt. Sinai Sch. Med. Uni. of N.Y. 1983. Nicholson has shown increased risk of death from lung cancer and mesothelioma even with exposures of 0.01 f/cc — a level undetectable by most dust measurement methods. It is therefore thought that no safe dose exists for asbestos in the induction of malignancies.

37 Murray, HM, in Report of the Departmental Committee on Compensation for Industrial Disease. Minutes of Evidence, Appendices and Index: c.d. 3495, 3496. Wyman and Sons, London, (1907); also London

H.M. Stationery Office, p.127 HMSO 1907, by H. Montague Murray, also in Charing Cross Gazette, London, (1900).

38 Hoffman, FL, Mortality from Respiratory Diseases in Industry Trades (Inorganic Dust), Bulletin U.S. Bureau of Labour Statistics No. 231, pp. 172–180, Washington, June (1918).

39 Cooke, WE, "Fibrosis of the Lungs Due to the Inhalation of Asbestos Dust" British Journal of Medicine, II, July 26, 1924.

40 Seiler, HE, "A Case of Pneumoconiosis. Result of the Inhalation of Asbestos Dust", British Journal of Medicine, II, p. 982.

41 Merewether, ERA and Price CW; Report on Effects of Asbestos Dust on the Lungs and Dust Suppression in the Asbestos Industry, HMSO, London (1930).

42 Merewether, ERA: The Occurrence of Pulmonary Fibrosis and Other Pulmonary Affectations in Asbestos Workers, J. Ind. Hyg. 12, 198–222, 239–257 (1930).

43 Merewether, ERA (1933). "A memorandum on Asbestosis" Tubercle 75 (Nov., Dec. 1933, Jan. 1934).

44 Wood, WB and Gloyne, SR (1934) Pulmonary asbestosis: a review of one hundred cases, Lancet 2: 1383–1385.

45 For example, Gloyne SR (1932) "The morbid anatomy and histology of asbestosis", Tubercle. 14: 445, 451, 493–497, 550–558; Ellman, P. (1933) "Pulmonary Asbestosis: its clinical radiological and pathological features and associated risk of tuberculosis infection". Journal of Industrial Hygiene 15: 165–183; Gloyne, SR (1932) "The Asbestos Body". Lancet I: 1351–1356.

46 *Addie M* v *Raybestos-Manhattan Company, Hartford Accident and Indemnity Company and The American Surety Company, Connecticut* — settlement of an asbestosis compensation claim in 1933 for $2500.

47 Letter from attorney Hobart to Brown, Legal Department of Johns-Manville Company, 15 Dec. 1934.

48 *Cali* v *Raybestos-Manhattan, the American Surety Company, The Hartford Accident & Indemnity Company, The Travelers Insurance Company, Connecticut* ($3500 settlement of asbestosis compensation claim of plant worker in 1937); *Siket* v *Raybestos-Manhattan, the American Surety Company, The Hartford Accident & Indemnity Company, The Travelers Insurance Company, Connecticut* ($4000 settlement of asbestosis compensation claim of plant worker also in 1937).

49 Merewether and Price (1930).

50 Schell, EL (1964) "Present T.L.V. in the U.S.A. for asbestos dust: A critique". Am. N.Y., Acad. Sci. 132: 316–321.

51 See further Ch 4 below.

52 Lynch, KM and Smith, WN, "Pulmonary Asbestosis: Carcinoma of Lung in Asbestosis" Am. J. Cancer, 24, 56 (1935); Gloyne, SR "Two Cases of Squamous Carcinoma of the Lung Occurring in Asbestosis" Tubercle, 17, 5 (1935).

53 Heuper, *Occupational Tumors and Allied Diseases* (1962).

54 Holleb, HB and Angirst, A in "Bronchogenic Carcinoma in Association with Pulmonary Asbestosis", American Journal of Pathology, XVIII, 1942, p. 123.

55 See Newhouse (1976) 61.

56 Doll, R, "Mortality from Lung Cancer in Asbestos Workers". British Journal of Industrial Medicine XII, 1955, pp. 81–86.

57 See for example Newhouse, ML (1969) Brit. J. Ind. Med. 26, 294 and Newhouse, ML (1974) *in* Biological Effects of Asbestos, Lyon, IARC Publications No. 8 ed Brogovski *et al.*

58 Selikoff, IJ, Churg J and Hammond EC (1964) "Asbestos exposure and neoplasia". Journal of the American Medical Association. 188: 22–26.

59 Selikoff, IJ, Hammond EC and Churg J (1968) "Asbestos exposure smoking and neoplasia". J. American Medical Association 204: 106–112. This topic is examined in some detail in Part 36.

60 McDonald JC; McDonald AD; Gibbs GW; Siemiatycki J; Rossiter CE (1971) "Mortality in the chrysotile asbestos mines and mills of Quebec". Arch. Environ. health 22: 677–686.

61 Nicholson, WJ (1983) Asbestos Health Update (review draft) Environmental Criteria and Assessment Office. p. 5.

62 See Lee and Selikoff "Historical Background to the Asbestos Problem" Environmental Research, 18, 300–314, (1979).

63 See also Leicher, Archives of the Tissues and Hygiene of the Tissue, 13, (1954), pp. 382–392.

64 Wagner JC, Sleggs CA, and Marchand P "Diffuse Pleural Mesothelioma and Asbestos Exposure" British Journal of Medicine, 17, p. 260.

65 Enticknap and Smither, British J. Ind. Med. 21; (1964).

66 Australia. Parliament, *Hazardous Chemical Wastes — Second Report, Report From the House of Representatives Standing Committee on Conservation and Environment* (1982) p. 112.

67 International Agency for Research on Cancer (1977) Monographs on the evaluation of carcinogenic risks of chemicals on men. Vol. 16 Asbestos p. 68.

68 Selikoff, IJ; Hammond, EC and Stedman H (1979) "Mortality Experience of Insulation Workers in the United States and Canada". An. New York Acad. Sci. 330 91–116.

69 Lee, DHK and Selikoff, IJ "Historical Background to the Asbestos Problem" Environmental Research, 18., 300–314, (1979) at 311.

70 Lee and Selikoff (1979) at 310.

71 British Occupational Hygiene Society, Committee on Hygiene Standards "Hygiene Standards for Chrysotile Asbestos Dust" *Annals of Occupational Hygiene* 11 (1968) 47–69.

Chapter 4
Standards and legislation

4.1 In the early 1930s the United Kingdom recognised asbestos as being injurious to health and in 1931 introduced regulations to control its use. These required exhaust fans to be provided for certain operations and prohibited other occupations from being carried out by hand. The regulations did not prescribe any maximum acceptable level of exposure.

4.2 In 1938, the American Conference of Governmental Occupational Hygenists proposed a level of 5 million particles per cubic foot (mppcf), on the assumption that this level would be low enough to prevent asbestosis. The ACGIH recommendation was widely accepted as a de facto standard not only in the U.S.A. (where it was not superseded for 30 years) but also in Australia as well.

4.3 In 1945, this standard was adopted in Victoria and incorporated in the Victorian Harmful Gases, Vapours, Fumes, Mists, Smokes and Dust Regulations. However, it was not until 1964 that there was any official recognition of this standard in New South Wales. In that year, Rules made under the *Mines Inspection Act* 1901 established 5 mppcf as the statutory limit[1] (there being no official statutory limit for premises not covered by the *Mines Inspection Act*).

4.4 In 1969 a new limit was set in the United Kingdom for occupational exposure to asbestos. This limit was 2 fibres per cubic centimetre (2f/cc), which is the same as 2 fibres per millilitre (2f/ml), this fibre count being averaged over an 8 hour shift, 40 hour week. This was the first statutory limit based on reasonably high quality human dose-response data. The level was chosen with the specific objective of achieving a risk of asbestosis of less than 1% after a 50 year working lifetime. (There was no expectation that the level was low enough to eliminate the risk of malignancies.) Monitoring a standard defined in terms of fibres[2] rather than dust particles depended on the use of the membrane filter method and phase contrast microscopy. By then use of this method was well established.

4.5 Also in 1969, the National Health and Medical Research Council recommended an exposure limit of 4 fibres per cubic centimetre (8 hour time weighed average). In January 1973, following a direction by the Chief Inspector of Mines, the permissible level of fibres was reduced to this level for the purposes of the *Mines Inspection Act*. The *Mines Inspection Act* was further amended in 1978 to reduce the permitted level to two fibres per millilitre (= 2 fibres per cubic centimetre) in line with changes in the NH and MRC recommendations. The most recent regulation, made under the *Occupational Health and Safety Act 1983*, specifies that, as from June 1984, long term fibre concentrations must not exceed 1 fibre per millilitre of air in the case of chrysotile, and 0.1 fibres per millilitre in the case of amosite or crocidolite.[3]

4.6 Many workers in occupations other than mining, are also exposed to serious asbestos hazards. However, with the exception of the 1945 Victorian Harmful Gases Regulations, it is only relatively recently that regulations have been introduced in the States to control industrial exposure to asbestos.[4] These regulations,[5] which were implemented in Queensland (1971), South Australia (1976), New South Wales (1978), Victoria (1978), Tasmania (1979) and Western Australia (1978), are all designed to protect workers from the harmful inhalation of asbestos dust that is or may be produced from an asbestos process.[6]

4.7 In New South Wales (until June 1984), Victoria, South Australia and Tasmania, workers employed in an asbestos process[7] must not be exposed to more than an average of

two fibres of chrysotile asbestos per millilitre of air (one fibre in Western Australia).[8] These limits are variously referred to as a 'threshold limit value', 'prescribed maximum concentration' or 'standard of acceptable exposure'. Equipment producing an exhaust draught (or other effective measures) must be provided, operated and maintained which will prevent the concentration of asbestos dust exceeding this amount. In Queensland, an asbestos process must not be carried on unless equipment is provided, maintained and used which prevents the entry of asbestos dust in the air of any workplace.

4.8 Where it is impracticable to comply with this requirement,[9] then in each State except Queensland, approved respiratory protective equipment and approved protective clothing must be provided where workers are likely to be exposed to the inhalation of asbestos fibres in excess of the prescribed maximum concentration.

4.9 In South Australia and Tasmania, the use of crocidolite (blue asbestos) is banned, while in New South Wales, Western Australia and Victoria it may only be used with permission of the Chief Inspector. This will only be granted under stringent conditions and for a period no longer than 12 months.

4.10 There is a number of less significant obligations, each peculiar to an individual State, which cannot be discussed here for reasons of space.

4.11 Experience in recent years has shown that these limits were too high with respect to lung cancer and mesothelioma, and in some countries the standards have been revised to take into account the cancer risk. The American Occupational Health and Safety Administration on 4 November 1983 issued an emergency temporary standard lowering the permissible exposure limit (PEL) for asbestos from 2 to 0.5 fibres per cubic centimetre of air (for an eight hour time-weighted day). However, this standard was subsequently stayed by court order.

4.12 In August 1983, Britain's Health and Safety Commission, similarly impressed by evidence on the cancer links, recommended that there should be a ban not only on the importation of raw crocidolite and amosite but also on the manufacture of all products using these materials. In relation to chrysotile, the Commission recommended that as from August 1984 the permitted limit for chrysotile be halved to 0.5 fibres per millilitre. This was less than eight months after the introduction of the previous limit of 1 fibre per millilitre on 1 January 1983.

4.13 In contrast, the 1984 Royal Commission on use of Asbestos in Ontario, concluded:

> We find in the cases of chrysotile mining and milling and of general chrysotile manufacturing that the disease risk associated with chrysotile exposure under 1 f/cc control limit, effectively enforced, involves a projected mortality rate well below the mortality rate that results from industrial accidents in all Ontario manufacturing. It therefore falls well within the bounds of a societally acceptable industrial risk.[10]

4.14 The current Australian standard for occupational exposure to asbestos, as recommended by the National Health and Medical Research Council is one fibre per millilitre of air for chrysotile asbestos and 0.1 fibre per millilitre of air for crocidolite and amosite.

4.15 The current recommended Australian exposure standard differentiates between asbestos fibre types, and is more restrictive for crocidolite and amosite than the emergency temporary standard issued by the United States Occupational Safety and Health Authority. Consistent with this recommendation in New South Wales, from June 1984 long term fibre concentrations must not exceed one fibre per millilitre of chrysotile, and 0.1 fibres of amosite or crocidolite.[11]

LEGISLATION APPLYING TO THE BARYULGIL OPERATION

4.16 In view of allegations of serious breaches of asbestos-related safety regulations at Baryulgil, it is important to detail exactly which regulations applied, when, and the extent of the obligations imposed on the operators by those regulations.

4.17 The first legislation governing permissible dust levels in New South Wales was introduced in 1964. In that year general rule 65B, made pursuant to section 55 of the *Mines Inspection Act* 1901, came into force. This was gazetted on 24th July 1964. This rule provided for a maximum of 5 million particles per cubic foot of air. The level was to be determined by the use of the 'impinger' method.

4.18 In 1970 the Department of Public Health recommended that values for chrysotile and amosite should not significantly exceed 4 fibres per cc as measured by the membrane filter method. This became the standard accepted by the National Health and Medical Research Council. This recommendation was accepted by Mr J.H. Burford, Chief Inspector of Mines, as a standard and was adopted for control purposes at Baryulgil by 1973,[12] and the management of the mine was advised accordingly.[13] Thus on 23rd January 1973, Mr Burford, Chief Inspector of Mines, stated that:

> In the particular case of mining and milling within New South Wales it was explained that whereas G R 65B of *Mines Inspection Act,* 1901, required a standard of 5 million fibres asbestos per cubic foot, I had used provisions of the rule and informed the managements of Chrysotile Corporation of Australia Pty Ltd and Asbestos Mines Pty Ltd that the acceptable standard would be 4 fibres per ml.

4.19 On 3rd March 1978, rule 65B was amended to require certain companies to conform to the new requirement of 2 fibres per ml. On that date, the manager of Asbestos Mines Pty Ltd at Baryulgil was notified as follows:

> Presently dust concentrations are above this level in the mill and until this lower required level is attained, every person employed in the mill both employees and staff, are required to wear an approved type of respirator, agreed rest areas excepted. Any person sighted without a respirator will be regarded as having committed an offence against this Act and any such individual, together with the manager, will be proceeded against.

4.20 The relevant legislation is summarised in Table 1 below:

TABLE 1 Regulations relating to asbestos applicable during the operation of the Baryulgil mine[14]

1944–1964	None
1964–1972	5 million particles of dust per cubic foot[15]
Jan 1973 — March 1978	4 fibres per ml
March 1978 — April 1979	2 fibres per ml

4.21 The regulation of emissions *outside* the Baryulgil mine falls within the jurisdiction of the State Pollution Control Commission and the Acts it administers, namely the *State Pollution Control Commission Act* 1970, the *Clean Waters Act* 1970 and the *Clean Air Act* 1961. These Acts and their Regulations empower the Commission, in part, to ensure that all practical measures are taken in accordance with these or any other Act to prevent, control, abate or mitigate the pollution of the environment, to control or regulate the disposal of waste and otherwise to protect the environment from defacement, defilement or deterioration. The limited extent to which this legislation and the *Clean Air Act* in particular, impinged upon the Baryulgil operation, is considered in Chapter 6 below.

ENDNOTES

1 General Rule 65B, made pursuant to s. 55 of the *Mines Inspection Act*.

2 For measurement purposes an asbestos fibre was defined in accordance with common international practice as a fibre longer than 5 microns$_{65}$ whose length to diameter ratio (aspect ratio) was at least 3 to 1. This definition originated in the United Kingdom, having been somewhat arbitrarily selected by three asbestos manufacturers who collaborated on the matter. It was apparently chosen to facilitate counting on the standard instrument of measurement, the optical microscope, and because it was thought that the development of asbestosis was related to longer fibres.

3 Occupational Health and Safety (Asbestos Dust) Regulation 1984.

4 See Gunningham N *Safeguarding the Worker* Law Book Co. (1984) pp. 160–163.

5 Qld R. 9 made pursuant to s. 38 *Factories and Shops Act* 1960–1975; S.A. Industrial Safety Code Regulations, reg. 39 (as amended); N.S.W. Factories (Health and Safety — Asbestos Processes) Regulations; Vic., Labour and Industry (Asbestos) Regulations 1978; Tas., Industrial Safety Health and Welfare (Administrative and General) Regulations 1979, Part VI, Div. 2; W.A. Asbestos Regulations 1978. See also *Industrial Safety Health and Welfare Act* 1977 (S.A.) schedule, item 44, inserted by Act No. 29 of 1983, and Construction Safety Regulations reg. 219B. These amendments relate to the removal of asbestos from buildings and the granting of licences in relation to such work.

6 The regulations do not cover all workers. For example, in Vic., brake and clutch maintenance workers, and most workers in the construction industry are not protected. In S.A. the regulations have been amended to ensure that they apply to premises that are *wholly* concerned with the manufacture of asbestos-related products.

7 Broadly, the mixing, processing, application or otherwise handling of any asbestos, but see definition in each State.

8 This being a time-weighed average sample, collected over a period of eight consecutive working hours. In S.A. there is a further requirement that no worker shall be exposed at any time to concentrations of asbestos fibres in excess of ten fibres separately longer than five micrometres, per millilitre of air.

9 The onus is on the occupier to establish impracticability. The main situations where it is likely to be established are operations of a temporary nature, such as the removal of lagging from boilers, furnaces, heating appliances and associated equipment and other insulation containing asbestos. In S.A. impracticability is not specifically made an excuse for non-compliance with reg. 39(3). However, where workers are likely to be exposed to inhalation of asbestos fibres in excess of the prescribed maximum concentration, protective equipment must be provided.

10 Report of the Royal Commission on Matters of Health and Safety Arising from the Use of Asbestos in Ontario 1984, p. 11.

11 *Construction Safety Act 1912*, Regulation; Factories (Health and Safety — Asbestos Processes) Regulation 1984.

12 It would appear that the 4 fibre standard was in force from December 1972 (letter Mr Hills, Minister for Mines and Energy, to Mr Stewart, Minister for Health, 17 February 1978).

13 General rule 65B had previously set the standard for permissible amounts of various types of dust, and for asbestos dust. This rule provided, *inter alia:* 'The number of dust particles shall in the case of asbestos dust, be determined by the use of an impinger of a type approved by the Chief Inspector of Mines, and shall not exceed the limits set out in the table to this rule, or shall be determined by any other instrument which may be approved by the Chief Inspector of Mines for the purpose and at such concentration as may be approved by him: provided that the type of instrument to be used, the particle size range to be counted and the maximum allowable concentration may be specified by the Chief Inspector of Mines in respect of any particular type of dust.'

14 Although there was no requirement applying specifically to asbestos before 1964, a general rule was introduced on 22 June 1928 (Govt Gazette No. 79), requiring rock crushing plants not to be operated if, in the opinion of an inspector of mines, the dust produced could or was likely to be injurious to the health of persons. No limits were set. See also General Rule 65 and 65A, discussed at paragraph 6.5 below.

15 This is the equivalent of approximately 176 fibres per ml.

Chapter 5

Conditions under which the employees worked at the mine and processing plant

5.1 In 1944 Asbestos Mines Pty Ltd was formed with shares held equally between Wunderlich and James Hardie. Despite the joint shareholding, the day-to-day mining of the mine was in the hands of Wunderlich. In 1953, James Hardie Asbestos Pty Ltd purchased all the shares from Wunderlich and between 1953 and 1976 Asbestos Mines Pty Ltd was a wholly owned subsidiary of the James Hardie Group.[1] On 23 September 1975 the entire Hardies shareholding in Asbestos Mines Pty Ltd was sold to Woodsreef Mines Ltd. The mine and mill were closed on 24 April 1979.

5.2 The legal implications of that flow from the composite nature of the Hardie group are discussed in Appendix III, paragraphs 36–50. The Committee has concluded that notwithstanding the group's corporate structure, it operated very much as a cohesive entity. In other words, the subsidiary companies in the group operated substantially as agents of the parent company. Chapters 5 and 6 proceed on this basis. For convenience, the group enterprise is referred to hereafter as 'Hardies'.

5.3 Between 1953 and 1976 James Hardie and Coy Pty Ltd exercised its control and influence over Asbestos Mines Ltd through a variety of means. The Chairman of the board of Asbestos Mines was Mr Frank Page, the Technical Director of Hardies, and its board members were drawn from the board of the parent company. Mr Page assumed ultimate responsibility for the mine.[2]
The local manager, however, reported to Mr Page and was responsible for the routine operations at Baryulgil. Employed by Asbestos Mines Ltd, the local manager's autonomy extended to making decisions on employment, community relations, production rates, methods of dust control, general maintenance and industrial hygiene. He was also responsible for the purchase of supplies and some capital equipment. Matters of significant capital expenditure were referred to the Technical Director. This line of control was confirmed in the 'Burke documents' and by statements made to the Inquiry by Hardie Trading (Services) Pty Ltd (hereafter referred to as Hardie Trading):

> Mr Kelso — the local manager was very much the local organiser. Mr Page (Technical Director) resided in Sydney although he went to the mine very frequently and on a regular basis and corresponded with the mine manager. The mine manager was responsible for the operations at Baryulgil under the direction of Mr Page.[3]

5.4 Staff groups, notably the industrial hygiene unit of James Hardie and Coy Pty Ltd at Camellia, also had an important role to play in the operations of Asbestos Mines Ltd. Described as a 'watchdog', the unit regularly visited Baryulgil to take dust counts and to advise on dust control procedures.[4] (This is discussed in more detail later in Chapter 5.) In addition, the medical officer at Hardies, Dr S.F. McCullagh, prepared annual health reports on half of the workers at the mine each year.

THE MINING AND MILLING OPERATION

5.5 In the absence of a detailed statement of the mining and milling operation at Baryulgil being provided by Hardie Trading, the following description has been written on the basis of the evidence presented to the Inquiry.[5]

Mining

5.6 The quarrying of ore at Baryulgil was an open cut operation. Periodically one of the faces of the quarry would be blasted. It would then be rendered down by secondary firing. A bencher was used to drill holes in the surface prior to laying the explosives. When the

hole had been drilled, an airpipe was inserted and compressed air used to clear out the drill dust which had fallen back into them causing a blockage. After the holes were cleared the explosives were inserted.

5.7 The initial blast fractured the host rock into large boulders. Any loose boulders would be barred down to prevent them falling. The workers would then set about isolating the asbestos-bearing ore.

5.8 The larger pieces of millable ore were broken into a transportable size by men using jack-hammers, drills and sledge-hammers. Rocks containing little or no fibre would be sorted out and set aside in waste bins. When it had been reduced to a manageable size, the men placed the pieces containing asbestos into bins which, when full, were loaded onto trucks.

5.9 The Aboriginal Legal Service describes quarrying as 'the most labour intensive part of the operation' at Baryulgil:

> The number of men employed in the quarry varied over the years but it was usually in the range of twenty to thirty-five persons. Generally, the men worked in teams of two with each team breaking down the fibre-containing rocks, manhandling them into the bins and loading the bins onto trucks.[6]

The milling process

5.10 The ore was transported in skips from the quarry to the mill and deposited into a feed hopper at the first of the crushers. This crusher, which had no cover, consisted of two revolving jaws designed to break the larger pieces of ore into a more readily millable size. The ore passed by conveyor belt from the crusher into a wood-fired dryer which removed residual moisture, and then, by another conveyor, onto a further crushing process.[7]

5.11 The 'Hazmag' crusher, the next stage of the milling process, was designed to reduce the ore in size even further. It operated by revolving and flinging the ore against its internal walls so as to break it up and to expose the seams of fibre. The advantage of this technique was to release the fibre without damaging it. The ore, by now the size of pebbles, then passed to a series of shaker screens which were surrounded by canvas, where it was shaken in order to dislodge the fibre from the host rock.

Extraction

5.12 The object of this step was to shake the ore in order to release the fibre. An exhaust system over the shaker screens generated a vacuum uplift which sucked up any asbestos fibre released from the host rock. It was then transferred to another cyclone before being fed onto another screen where the process was repeated. The aspiration was such that the tailings, or gravel, remained on the screens, residual dust was carried to the dust house cyclone and asbestos fibre to the bagging cyclone.

Bagging

5.13 When the extraction process was complete the fibre was ducted to a bagging cyclone mounted on a single hopper from where it was emptied into bags. According to Hardie Trading bagging need not have been done totally by hand. It was possible for the worker in the bagging room to clamp a bag to the outlet of the cyclone and move away until it was full. It was also possible to control the flow of asbestos by using a gate at the bottom of the cyclone. The 'bagger' usually stood within a few feet of his bagging station. The bags were sealed with staples, although in the earlier years of the mine they were sewn up by hand.

5.14 In the very early days of the mill, no mechanical collection process existed and the bagging was done by hand. Even in the latter years of the mine's operation there was still

a certain amount of manual labour involved in bagging the fibre. For example the 1969 N.S.W. Department of Health report notes that:

> As each bag was filled up it was taken from the cyclone, tamped by bumping and hand pressed then topped up by hand on the scales.[8]

Dust collection

5.15 The dust from the extraction process was ducted to the dust house, a seperate shed. The duct work emptied into rows of several hundred suspended dust-collecting socks.

5.16 The principle is similar to that of a domestic vacuum cleaner. The bags, or socks, were made of a porous material so that the air could enter them and pass through their surface and into the atmosphere leaving the dust behind. Its porosity was reduced as more and more dust gathered on the inside wall of the sock and the bag began to fill up. When this occurred, an employee would manually shake the bags in order to dislodge the dust from their insides and thereby permit them to operate effectively again. Shaking the bags was performed regularly throughout the day and was done manually until about 1974.

The tailings hopper

5.17 The waste material left on the shaker-screens was moved by conveyor belt to the tailings hopper. From 1970 onwards it was sprayed with water as it went into the hopper with a view to preventing the generation of dust. It was then released into a truck. Hardie Trading stated to the Inquiry that as this occurred, the tailings were wet again by a water jet which hung above the hopper. They were then taken away to the top of the tailings dump or to whatever purpose they may have been used for.

5.18 The method of removing tailing was described by Mr E.G. Reeve, chief draftsman at Hardies, in a report of February 1966:

> The cut-off plates—that is, the plates on the hopper—are opened and the hopper contents are spilled on to the floor.
>
> This is then pushed into heaps and shovelled into the disposal bin placed at the south end opening to the building from whence it can be carted to the dump by the Fowler trucks.[9]

It is not clear to the Committee how long this latter method was employed.

TRADE UNION INVOLVEMENT AT BARYULGIL

5.19 There was little trade union activity at Baryulgil. Whilst employees were not forced to join a union, they were not discouraged from doing so. Commenting on the strength of union activity at the mine, Mr Burke said that the AWU:

> . . . did not seem to be interested in coming that far out of town or city or wherever they come from to bother about them.[10]

5.20 This view of the role of unions was reflected in the comments of a number of former workers and was also expressed by the Aboriginal Legal Service Ltd:

> . . . union action, such as it was—and it was virtually non-existent—came from within the work force at Baryulgil. Outside interests by the responsible union was virtually nil and as I say, it turned up only to collect the dues. The secretary of the relevant union, a man with a long and honourable history in the trade union movement and with a direct involvement in dust disease matters for half a century had never visited Baryulgil. In terms of acquainting the work force of the dangers of asbestos, I would say that union involvement was virtually nil. I qualify that by saying that the AWU did make efforts, following the death of Andrew Donnelly, to obtain compensation for his wife, although those efforts were not followed through. But that is just about the sum total of what the head office of the union did.[11]

1944–1958 (THE OLD MILL)

5.21 The mine and mill at Baryulgil were built and first operated in 1944. Only limited information is available as to the dust hazards during the period of the mill's operation, between 1944 and 1958. Mr Burke, initially foreman, and subsequently manager of the mine described conditions as follows:

> The old mill was such that when you walked in it was impossible to see anywhere. Even the operator standing beside you was practically invisible. The only thing you could see with the flow was to get pretty close to it and watch the flow of the screening and that sort of thing. There were no dust extraction systems on the mill. For the earlier period the process was just to blast the fibre into a room; then the employees on closing time got into the room and physically bagged the fibre. There was no mechanical collection whatsoever. For a period—I would say a few years before the new mill started they had a bag collection incorporated into the old mill. This made it a situation where, whilst it was still very dusty, it did not have the problems associated with having to shovel up and hold bags. Nevertheless it was still very dusty.[12]

5.22 Other workers describe working in a dense cloud of dust, being unable to see the wall inside the mill, a distance of a few yards, and shovelling asbestos dust into sacks while in such a dust cloud as to be unable to see the men holding the sack. While much of this dust may have been serpentine dust resulting from the crushing of rock, rather than asbestos fibre, it is clear that workers would also have been exposed to very substantial amounts of asbestos fibre,[13] particularly at the bagging operation where the dust would have consisted almost entirely of asbestos fibre.

5.23 The workers' own accounts of heavy exposure in the early period of the mill and mine's operation, are consistent with what little information is available from the health authorities. The only dust surveys conducted prior to 1960 were those undertaken by the N.S.W Department of Health in 1948 and 1952. Records of these inspections are not available, but a Department of Health report of 1960 noted that dust levels were 'considerably lower, except in one position', than those found in the earlier surveys.[14] and Dr Eva Francis, scientific officer in the Division of Occupational Health, subsequently commented that 'dust levels (at the primary crusher) were excessive in 1948 and 1952 as there was an inferior type of crusher plant'.[15]

5.24 It was also in the first decade of the mine's operation that the first evidence of asbestos disease among the workforce manifested itself. X-ray reports of two workers (Preece and Mundine) were made in 1949 by A. Sharland, and again in 1952 by W. Pook, a radiologist. In the second report, the diagnosis of Mr Mundine was 'of early asbestosis' and of Mr Preece of 'reticular fibrosis' (which is consistent with early asbestosis). Medical opinion would suggest that an asbestos mine that was generating radiologically detectable asbestosis within its first decade, (given that the latency period for asbestos is generally much longer)[16] would (in parts of the operation at least) be functioning under extremely dusty conditions.

5.25 No dust tests were taken between 1953 and 1959. From information provided by former workers it seems likely that, as the mill was getting older and due for replacement, conditions probably deteriorated further until the introduction of the new mill in 1959.

5.26 Although the evidence is incomplete, and although there is uncertainty as to the precise fibre levels to which workers were exposed, it seems very probable that the then recommended level of five million particles of dust per cubic foot was routinely exceeded. Levels of exposure were undoubtedly high enough to cause a substantial incidence of asbestos-related disease. Whether the x-rays of Preece and Mundine in 1949 and 1952 represent the tip of an earlier iceberg or the total of this recognisable disease, remains unknown. Baryulgil workers probably did not have ready access to the best medical care, and cases of asbestosis may well have been missed.[17]

1959–1969

5.27 The new mill at Baryulgil was built in 1958 and came into operation in 1959. There is common agreement that it was less dusty than its predecessor, but a number of witnesses gave evidence that it still generated substantial amounts of dust.

5.28 Mr Burke maintained that whereas in the old mill, you could not see your way around, the new mill was much improved but there was still a general haze.[18] Moreover, particular areas, such as around the stairway, near the hammer mill, at the number 9 tailings belt and around the bagging station, were still very dusty.[19] Similar accounts were given by the former fitter, Mr Hindle,[20] by a foreman, Mr Sheather,[21] and by a number of the Aboriginal workers.[22] Mr Marshall, the Chief Inspector of Mines, described conditions prior to the introduction of the first regulations in 1964, as 'the bad old days'.[23]

5.29 One particular problem identified by Mr Burke, was the difficulty of sealing any part of the mill in order to contain the dust or to enable its extraction. Thus the failure to isolate high dust areas from the relatively low dust areas resulted in the former polluting the latter. Although Mr Burke thought the plant was solidly built:

> there was not much thought, I feel, in the design of containing the areas, because one had rafters that were opened to the atmosphere outside and so one would get wind drift right through. One virtually could not seal off anything. It was not designed to be sealed off in areas so that one could control the dust situation.[24]

Similarly, the foreman, Mr Sheather, gave evidence that:

> The conveyer belts were all open — they had a roof over them to protect them from the weather but the sides were completely exposed. The ore falling on them and the travelling of the belts, particularly in windy weather, created a terrific amount of dust blown from the number three belt before it reached the mill.[25]

It was also suggested that the dust pipes through the plant were too small and that the dust fan had insufficient capacity to fully clear the air.[26]

5.30 How far these limitations in the new mill's design resulted in a dust hazard, is by no means clear. Again, apart from the anecdotal accounts described above, there is only very limited evidence available and some of this, as will be seen, may not be reliable.

5.31 The documentary evidence consists of the mine manager's reports, the District Inspector of Mine's reports, the reports of the Department of Public Health (whose dust surveys were sometimes conducted in conjunction with the Mines Inspectorate), and a report from E.G. Reeve, chief draftsman at Hardies, in 1966. Hardies did not conduct any dust monitoring at Baryulgil prior to 1970.[27] Neither the mine manager's reports nor those of the district inspector of mines, tell us a great deal about conditions at Baryulgil. The mine manager's fortnightly reports (available from 1968 on), are mainly concerned with production, and rarely make mention of dust levels. However, he does note that some officials visited the mine in October 1968 'primarily on a social call' but that 'there is no reason to suppose that the Drs (sic) left with other than a good impression as the principle of good housekeeping was evident in the mill',[28] and later, that the District Inspector of Mines had called on 1 August 1968, and had commented favourably on things in general.[29]

5.32 The District Inspector of Mines who carried out regular safety checks and visual dust surveys at the mine, had general responsibilities which did not include dust measurement and monitoring. This was the role of the special duties inspectors. The result was that the District Inspector had no particular expertise, or special concern with dust levels at Baryulgil. This is reflected in the contentions of his reports between 1958 and 1969, which generally do not deal with dust levels, beyond the frequent comment that the plant was in good working order and safe condition. Only occasionally did he address himself specifically to the issue. In March 1959 he expressed the view that 'the (new)

plant is of modern design and every precaution has been made to eliminate the dust hazard'. In April 1960 the manager 'was asked to eliminate the quantity of dust produced when changing bags in the dustroom'. In November 1964 the inspector noted that 'the mill is in good working order and every endeavour is being made to review the dust hazard'.

5.33 The New South Wales government agencies conducted only three dust surveys between 1958 and 1970. All three were made by the Department of Health, although the Mines Inspectorate was also involved in the last of these. The results are summarised in Table 2 (Appendix IV).

5.34 The first survey, on 22 March 1960, revealed levels of dust generally below the recommended limit of 5 million particles per cubic foot (5 mppcf),[30] although levels in the bagging room were four times this amount. Otherwise dust exposures were 'satisfactory throughout this undertaking'. The Department of Public Health concluded:

> Dust concentrations found in the new plant are considerably lower than exposures existing when previous inspections were made in 1948 and 1952. Installation of the new crushing plant has virtually eliminated a dust hazard which existed in earlier years.[31]

The 1963 test, with measurements taken at three sites, showed levels of dust in each case well below the recommended limit. On this visit, dust at the bagging point was only 0.6 mppcf.

5.35 The 1969 survey[32] was less positive; showing 'some deterioration in dust enclosure from when previously inspected. The atmosphere was visually dusty in most parts of the mill'. Bagging was described as:

> a very dusty process . . . the atmosphere was dusty, dust evolving from bag filling and loading and from the . . . conveyor feed into the loading bins . . . A respirator, considered essential in this area, was hanging in the plant and was covered in dust. In relation to the separating plant, it was stated that there was 'considerable dust leakage'.

In relation to the bagging point, the report stated that:

> A considerable amount of asbestos dust leaked from bags and blew up into the mill generally . . . All were dusty operations and were done without exhaust ventilation or respiratory protection. Bags were then sewn and stacked. One operator is continuously on bagging for 8–9 hours per day.

5.36 Commenting on the general condition of the mill the report states:

> Ventilation of the mill depended on large doorways, open walls and smaller openings. Strong breezes blowing through tended to disturb deposited dust. Waste material was used on road making and also caused dust through the area. On this day, dust from this source, and at plant, driting over the manager's house, giving rise to minor, but unnecessary, exposure of the residents to this dust.

The report concludes:

> The results indicate relatively high concentrations of dust throughout the plant with the possible exception of the primary crusher. The major cause of this dust is leakage from filter bags, conveyors, screen covers and feed, and bag handling and filling . . . Accumulated dust is being disturbed by wind and to some extent vibration. The conditions appear to have deteriorated since 1963.

According to the report:

> Use of the old contaminated bags contributes, as does rough handling of bags. However, the major sources are leakage during parts of the filling, tamping weighing and topping up by hand. It is evident that this process should be enclosed as much as possible and maintained under effective exhaust ventilation. An inlet face ventilation across the booth here should be at least 120 feet per minute. In the interim, the operator should use an approved anti-dust respirator. Care should be taken in handling bags and topping up.

> Consideration should also be given to periodically cleaning down the plant by vacuum, rather than relying on sweeping, brushing, or blowing.

5.37 Despite the concerns expressed in the report, dust levels generally were recorded as being within the then legal standard of 5 mpccf. Where samples were taken using the membrane filter method, at most test sites they were within the then National Health and Medical Research Council recommended level of 4f/ml (referred to in some reports as 4 f/cc, which is identical). However, dust levels at the left and right shaker screens and at the bagging point did exceed these limits.

5.38 The results of all three surveys must be treated with caution, since there are good reasons for believing them to be substantial underestimates. These reasons are explored more fully later in this report. Briefly, the evidence is that inexperience in dust counting (using the membrane filter method) resulted in the government agencies underestimating dust levels, and that forewarnings of inspections were given which resulted in clean-ups which disguised some of the hazards.[33]

5.39 Probably a more accurate indication of dust levels during this period would be the first of Hardies own dust surveys, conducted in September 1970, and described below. This revealed 'alarmingly high dust levels' in some locations and an overall exposure level well in excess of the then recommended standard of 4f/cc/shift. Since there was no evidence to suggest that conditions deteriorated prior to the 1970 survey, it is a reasonable assumption, supported by the accounts of the former workers and of the mine manager, that conditions prior to 1970 would have been at least as poor as those actually monitored in that year.

5.40 Such a conclusion is consistent with the other documentary evidence for the period, the report of a visit to Baryulgil in 1966 by Mr E.G. Reeve, Hardies chief draftsman. Although Mr Reeve remarked that 'housekeeping at the moment is excellent', he also noted that dust from eight dust hoppers, four on each side of the building, was spilled onto the floor, pushed into heaps and shovelled into a disposal bin to be carted to the dump by Fowler trucks. Reeve went on to describe the fineness of the dust adding that:

> only an occasional particle can be felt. There is no visible fibre, though when floating in the air in sunlight a few fine fibres can be seen. In this condition of course the material cannot be dropped without it floating away in great clouds.

Further the report notes that:

> whilst the question of disposal of dust from the hoppers was fairly fully investigated, as being the prime purpose of the writer's visit, attention was drawn also to the process of cleaning the dust socks. This is obviously the greater hazard and requires attention even more urgently than the final disposal of the dust. Photographs were taken of the two operations for some rough comparison. The photographic processor did not print the sock cleaning operation, presumably regarding it as blank film which it most certainly is not.[34]

5.41 How can one reconcile the accounts of the District Mines Inspector, the dust levels recorded in the Department of Health surveys, with the accounts given by the workers themselves, and with the comments of Mr Reeve in 1966?

5.42 One explanation might be that conditions between 1959 and the mid 1960s were quite good, and that only after 1965 was there a general deterioration, thus explaining the less than positive description of Mr Reeve in 1966, and the comments (if not the dust measurements) contained in the 1969 Department of Health Report.

5.43 However, while some deterioration may have taken place over time, this seems unlikely to provide a full explanation. Many of the worst conditions described in the 1969 report (the use of contaminated bags, leakage during filling, tamping, weighing, lack of an enclosed process and so on) were inherent in the system of work at the mill. This would not have changed markedly during the 1960s. Similarly, the worst defects identified by

Mr Reeve in his report in 1966 were long term inherent in the way the mill had been operated.

5.44 To the extent that there is a conflict of evidence, the Committee prefers the accounts of Hardies chief draftsman, of the workers themselves, and of the 1969 report (if not the dust levels recorded) all of which are consistent with Hardies own subsequent report in September 1970. The Committee concurs with the summary of Dr Eva Francis of the Division of Occupational Health:

> General descriptions in the earlier reports of conditions at the time are of special interest. These indicate that extremely dust generating procedures were in use for many years. It is obvious that the use of dust control measures and respiratory protection were extremely limited.[35]

1970–1976

5.45 In 1970 there was a dramatic change in the method of dust counting with the introduction of the membrane filter method, which allowed for more precise standard setting and dust measurement. It also allowed for quantification in terms of asbestos fibres per cubic centimetre i.e. f/cc (sometimes referred to as fibres per millilitre f/ml, which is identical) rather than in terms of millions of particles of dust per cubic foot (mppcf).

5.46 1970 was also the year that dust counting stations were established by Hardies in order to monitor airborne dust levels at particular locations in the quarry and mill. There were some thirteen dust-counting stations on site. These were located in the quarry and throughout the mill. These locations included the mill loading dock, near the driver of the truck in the quarry, at the quarry face, near the mill operator, beside the operator at the primary crusher, next to No. 1 shaker-screen, beside the drill in the quarry, at the dust collector (sock level), with the 'bagger', by the tailings bin and downwind of the truck at the tailings dump. From 1970, Hardies own measurements [36] can be compared with the less frequent tests undertaken by the government agencies.

5.47 Hardies own 'acceptable' standard of exposure (as from 1969) was 4f/cc, but the NSW Department of Mines continued to operate with a legal standard of 5mppcf until January 1973, when, by direction of the Chief Inspector of Mines the limit of airborne asbestos was changed to 4f/cc. In 1973 Hardies adopted an internal 'accepted' level of half this amount.

5.48 Ownership of the mine was transferred to the Woodsreef group in September 1976.

THE DUST COUNT RESULTS

5.49 The results of dust surveys conducted by the New South Wales Departments of Mines and Health and by Hardies, are set out in Appendix IV Tables 2 and 3 respectively. For a variety of reasons, it is necessary to exercise extreme care in interpreting these readings. In particular:

- the sampling method used, while a substantial improvement on its predecessors, was in a developmental stage in New South Wales prior to about 1972. There was some initial uncertainty as to how measurements should be taken and fibres counted,[37] and the Division of Occupational Health experienced particular problems.[38]
- the large majority of dust counts (particularly in the early 1970s) are 'engineering' dust counts, based on samples taken over a 10 minute period in fixed locations throughout the mill, often in areas where high dust emissions were anticipated. Therefore they do not represent breathing zone conditions for any employee over an eight hour working day.[39] In order to determine whether an individual has been exposed to more than the 'acceptable' daily dose (i.e. 4f/cc *averaged* over an eight

hour shift) it is necessary to take account not only of the level of exposure at each particular point where he is working, but also the time he is working at each of those points. That is, it is not valid to compare the 4f/cc standard taken over an eight hour shift with engineering dust counts taken over a ten minute period, without proper interpretation.[40]

It was only in 1975 that the Division of Occupational Health began to take long term samples using personal samplers, capable of giving a more accurate representation of actual breathing zone conditions in an employee's normal working day. Hardies, however, made some use of personal samplers from 1970 onwards.

- As the National Health and Medical Research Council has pointed out, hygiene standards (e.g. the 4f/cc standard) "should only be used as *guides* in the control of health standards, NOT as very fine lines dividing 'safe' from 'dangerous' conditions. The data on which the standards are based is seldom accurate enough to warrant disputes about slight deviations (plus or minus 20%) from the values listed".[41]
- samples taken on a particular day may not be representative of normal conditions at the mine and mill. If readings are taken during dry windy weather, they will record dust levels much higher than if the weather has been wet. Wide fluctuations between readings taken weeks or months apart (without any intervening modification of the equipment) were frequently attributed to weather conditions in official reports.[42]
- there are allegations that the mine operators had prior warning of inspections by the government agencies. It is suggested that these inspections were preceded by systematic clean up and the mill was run at a reduced rate in order to artificially lower dust levels for the duration of the inspection. These allegations are considered in Chapter 6.

5.50 Even with these provisos, it would seem that dust levels at Baryulgil between 1970 and 1976 were excessive, judged by the standards of the time. For practical purposes this standard was 4 fibres per cubic centimetre (4f/cc), the level recommended by the National Health and Medical Research Council in 1969, adopted by the Hardies in that year, and ultimately applied as a legal standard at Baryulgil in January 1973.[43]

5.51 It will be apparent from the record of Hardies dust counts between 1970 and 1976 (table 3) that dust levels generally far exceeded the 4f/cc standard. The overall average dust concentration in all dust stations was about 19 f/cc and only one station averaged below 4f/cc.[44] While the Committee recognises that the set of papers made available to it is probably incomplete,[45] and that the missing papers might contain more favourable results, the overall picture is clear. Dust levels routinely exceeded the acceptable level and in some cases readings were far higher. The mining of ore, crushing and fibre separation, bagging and tailings disposal, all produced excessive levels of atmospheric dust.

5.52 Most of the recorded dust levels are based on engineering samples rather than on personal exposure levels. However, it is clear that asbestos dust levels in the general interior of Baryulgil mill were so high that even if some workers only spent relatively short periods on the most obviously hazardous processes during their working day, the combined effect of these levels would have averaged out to an excessive level of exposure in the case of some, if not the majority of workers.

5.53 Equally revealing are the comments contained in the reports themselves. In particular, the remarks made by Hardies Industrial Hygiene Engineer Mr Winters, and by their Federal Medical Officer Dr McCullagh, provide considerable insights into conditions at Baryulgil.

5.54 For example, Hardies first industrial hygiene survey was in September 1970. Winters, in his report, notes that:

> it can be said that at locations where men are working for 8 hours per day dust levels are reasonable, however, there are several locations where men are required to work for shorter periods of time, which have alarmingly high dust levels.[46]

Only two of the nine dust sampling points registered below 4f/cc, most were between three and eight times this level but stations five and nine recorded far higher dust levels. Winters reported:

> dust levels at these locations are alarmingly high, the bag shaking operation recording an average count of 245 f.p.c.c. and the emptying operation recording 302 f.p.c.c. The operator is subject to dust levels created by the shaking operation for about 1 hour per day and by the emptying operation for about 2 hours every 2 to 3 days.[47]

5.55 Again, workers would only have to be exposed to such concentrations of fibres for a brief period to exceed the recommended 4f/cc level (averaged over an 8 hour shift). Since the report indicates that the general dust level in the mill was 19f/cc,[48] the overall exposure of workers in the mill, and particularly those involved periodically near stations 5 and 9, would have exceeded the recommended level.

5.56 A similar point is made by Dr McCullagh in relation to the asbestos bagger, where the dust level was 8f/cc:

> I doubt that much comfort can be taken from the fact that the operator only spends about 50% of his time in this area, for the general level of dust in the mill appears to be 19 fibres per ml. (Though this level may be lowered when the vacuum cleaner is repaired).[49]

Both McCullagh and Winters noted the urgent need for certain dust control measures.

5.57 Three months later, only very limited improvements had been achieved, the most important of which was the introduction of a wetting spray to the tailings hopper, where dust levels were (at least temporarily) halved. Some reductions were also achieved at other dust stations but others increased, and at the dust collection sock, levels had gone up from 245 to 1760f/cc, leading Dr McCullagh to comment:

> At the dust collector sock level the dust count approaches 2,000 fibres per ml. With counts of this order the fact that an operator is only so exposed for about an hour a day provides only grossly inadequate protection.[50]

5.58 In subsequent surveys, dust levels fluctuated considerably. At times dust counts showed dramatic improvements[51] (occasionally for no obvious reasons[52]) only to be followed by a marked deterioration a few months later.[53] Sometimes, improved results were attributable to favourable weather conditions (rain preceding the tests) while disappointing results were blamed on dry, windy weather,[54] or on other transitory factors.[55] Sometimes substantially reduced fibre counts were achieved at particular dust stations[56] while others continued to give high readings and even to deteriorate.[57]

5.59 The results of these dust surveys are summarised in Table 3, and little would be achieved by describing the month to month fluctuations in further detail. More important is the overall picture these surveys paint.

5.60 Despite some initial optimism, both Mr Winters and Dr McCullagh continued to express grave concern about the results at particular dust stations. References to 'an alarming increase' or to 'alarmingly high' dust levels at particular measuring points, are not uncommon.[58] Eighteen months after the initial survey, Dr McCullagh states the 'picture is gloomy'.[59] As Table 3 shows, the majority of dust stations, often had engineering counts over 4f/cc, and some of the problem areas, notably the dust collector sock (station five) and the dust collector emptying storage hopper, (station nine) continued to give readings substantially in excess of the recommended levels.

5.61 In February 1972, V. Gerrard, acting in Dr McCullagh's absence, presented the results of the 1971 medical review of Baryulgil miners to Head Office in which he stated that 'standards of hygiene are still deplorable and will form the subject of a separate

report.'[60] Later that month, Gerrard submitted this report during which he drew attention to the sock and dust collector building:

> This is unquestionably the worst dust source. I inspected the mine on a mild still day after much recent rain. Nonetheless billowing clouds of fibre could be seen coming from this building and Mr Burke tells me he has, on occasion seen such clouds from distances of several miles. We have on previous occasions, obtained counts of about 1,000 fibres/cc here and I have no doubt that the count was of that order when I made my inspection.[61]

Not all the reports are gloomy. Thus Mr Winters, commenting on a survey on January/February 1973 (when eight of 11 stations monitored were clearly over 4f/cc) said:

> If one compares the dust figures obtained from this survey with those of the previous survey an erroneous conclusion can be reached that no improvements have occurred and that maintenance in the plant had deteriorated badly. This is far from the facts in that the plant is in good condition, housekeeping is good and improvements have occurred.

The probable explanation for the apparent increase in dust levels is the extremely hot dry conditions under which the survey was conducted (temperature 110 degrees F max.). Moreover, all but one of the personal dust count samples at this time were below the 4f/cc standard.

5.62 There is a gap in the records available for much of 1974 and 1975 and one can only speculate at the results. However, given that only selected documents were made available to the Committee, it must *not* be assumed that the missing documents recorded high dust levels.

5.63 Of the results that *are* available, the September 1974 results show that dust levels for six of the eight stations tested were above 4f/cc.[62] Levels at the mill tailings hopper were as high as 54.6f/cc and at the dust collector sock level, 94.7f/cc. These results were followed, in the two available 1975 surveys by very marked improvements, only to be followed by more mixed results in 1976. The last available records are for August and September 1976, just before the mine was sold to Woodsreef. The August report shows that six of the nine stations monitored were above 4f/cc, although windy conditions may have contributed to this result.

5.64 The final document, in September 1976, refers to details of personal dust samples to be given to the Environment Control Committee meeting of the next month. One of the dust counts is described as 'unable to count' and the comment is made 'it is thought that the dust level on this filter would be in excess of 500f/cc per shift but as the dust is layered on the filter this is really only an educated guess. Please ensure the man wears an airline respirator while performing this task'.

5.65 Over the same period a series of dust surveys and inspections were also conducted by the New South Wales regulatory agencies. The Division of Occupational Health visited Baryulgil in 1970, twice in 1972 (once in conjunction with the Mines Department) and in 1975, and the Department of Mines conducted its own survey in October 1973. Reports were also made by the District Inspector of Mines, but since these were not concerned primarily with dust hazards, nor did they involve dust monitoring, they add little to the overall picture.[63]

5.66 The results of the Department of Mines and Division of Occupational Health surveys are set out in Table 2. Some of these reports are broadly consistent with Hardies own reports. For example the 1970 report for the Division of Occupational Health identified the bag house as the point of maximum exposure where 'the operator was exposed to extremely high dust concentrations'. High levels of exposure were also noted at the point where the tailings were emptied. The report concluded: 'Although the bag house and tipping operation could well average out below (4f/cc/shift), massive short term exposure should be avoided. Dust control measures should be instituted in the bag house and respiratory protection used in the tipping operation.'[64]

5.67 In 1971 the Chairman of the Dust Diseases Board, reported on an inspection of the Baryulgil mine by a member of the Board, the Board's inspector and the Board's medical officer. He stated that all three 'consider that a definite dust hazard exists in the mining operation and throughout the ore treatment plant.'[65] They found that dust extractors were fitted at various parts of the plant but did not eliminate the apparent dust disease hazard.

5.68 Again in March 1972, the inspector's report concluded 'all tests except that in the atmosphere outside, taken by membrane filter method . . . gave results in excess of the recommended standard of exposure to asbestos of 4 fibres per millilitre . . .'.[66] These included a number of tests in the breathing zone of operators.

5.69 Other surveys conducted by the government agencies indicated a more favourable picture. The report for August 1972 by the Division of Occupational Health concluded that several improvements had been made and that all fibre levels were substantially lower than the previous inspection.[67] The Department of Mines report of an inspection made at the same time, was even more favourable. It concluded, amongst other things, that:

> the mill internally is remarkably free from dust. Floors were vacuumed then sprayed with water, and belts, shaking tables and doorways were shrouded by PVC fabric facilitating the dust extraction system and preventing wind from blowing across transfer points. Bagging may produce harmful dust but only the results of sampling will indicate this. . . . There seems little likelihood of asbestosis occurring in the plant, seen from a superficial examination of the dust collection and supression. Probably only 8 men come in contact with dusty conditions and then only for short periods. The general approach from the management to dust control in this area was an encouragement and is no doubt due to good work by the district inspector.[68]

The dust counts for the August survey showed that:

> All areas except outside the plant show fibre counts above the statutory 4 fibres per cubic centimeter. However, it should be noted that except for one man in the bagging section none of the other employees spent more than about one hour per day in these exposures.[69]

The Mines Inspectorate's own survey report in October was also favourable, with only one dust count registering over 4 f/cc.

5.70 The final inspector's report before Hardies sold the Baryulgil operation was in October 1975. After giving dust counts, the report concludes:

> All concentrations are below the recommended standards of 4 fibres per m/l of air for chrysotile. In general, conditions were satisfactory and dust levels were lower than found on the previous inspections.

5.71 Taken at face value, these latter surveys suggest that there was substantial (but by no means complete) compliance with prescribed standards over a fairly lengthy period. This is a very different view from that provided by Hardies own internal readings. Certainly Hardies were making improvements through the period 1970–1976, but their own readings do not suggest anything like the degree of compliance with the 4f/cc standard, as do those of the government agencies.

5.72 As in the previous period, the question arises: how can these disparities be reconciled and which set of documents more closely approximate the true facts? For example, how can one reconcile the 1969 report by Mr Jones from the Division of Occupational Health which recorded comparatively low dust counts, with the 'alarmingly high' levels recorded at some points in Hardies September 1970 survey?

5.73 Hardies themselves had little doubt which was correct. Dr McCullagh commented:

> we were disinclined to accept [Mr Jones'] figures at the time and Mr Winter's report indeed makes it clear that dust levels are much higher than Mr Jones believes — of 9 dust stations monitored by Mr Winters only two had counts below 4 fibres per ml.[70]

5.74 There are strong reasons for believing that some of the government agencies' figures are substantial underestimates of the true dust levels. First, there is the evidence, examined in detail in Chapter 6, that the mine management received prior notice of inspectorate's visits, that systematic clean ups preceded each visit.

5.75 Second, there are suggestions that the inspectorate experienced difficulties in using the membrane filter method, and that these difficulties, and inexperience in interpreting the results, led to underestimates of asbestos fibre levels. for example, Dr Eva Francis, of the Division of Occupational Health subsequently commented:

> The 1969 investigation gives the first membrane filter figures, but the 1969 and 1970 results are not comparable with later membrane filter results because of reduced resolution of fine fibres due in part to the use of normal transmitted light microscopy. Results from 1972 were obtained using phase contrast microscopy which gives far greater resolution of fine asbestos fibres. Hence the 1969 fpcc figures are underestimates.[71]

Similarly, Dr McCullagh, of Hardies noted the disparities between the results of a Department of Mines inspection in October 1973 and Hardies own results and commented:

> The asbestos in air levels recorded by the Inspector are lower than may commonly be found at the Mine. This may, in part, be due to a lack of experience, or practice, in the technique of mounting and counting samples but was, no doubt, substantially contributed to by the lack of wind on the day on which the samples were taken and the fact that on the previous day 6 inches of rain had fallen in the Grafton area.[72]

These, and a number of similar comments, together with the evidence of prior warnings, incline us to prefer the evidence of Hardies own surveys to those of the regulatory agencies, during this period.

1976–1979: WOODREEF'S OWNERSHIP

5.76 Woodsreef Mines Limited acquired ownership of the Baryulgil operation on 23 September 1976. Woodsreef submit that Asbestos Mines Pty Ltd was bought solely for the purpose of acquiring its mining tenements in the Baryulgil area which surrounded existing mining leases held by another wholly owned subsidiary of this Company. However:

> While [Asbestos Mines Pty Ltd] was acquired for its mining tenements this Company undertook to the previous owner that mining operations would continue until at least June, 1977 so that continuing employment would be availabe for those employed at the mine notwithstanding that [Asbestos Mines Pty Ltd] was, and had been for some years, operating at a loss. Operations were in fact continued at a loss until 24 April, 1983.[73]

From the date of its acquisition in September 1976 until the closure of the mine, Asbestos Mines Pty Ltd employed an average of between 10 and 12 employees. Their duties involved the mining, milling and bagging of chrysotile asbestos.

5.77 Shortly after the takeover, Matt Peacock's ABC Broadband program evoked considerable public concern about the hazards of asbestos, and the New South Wales Mines Inspectorate began to take a much more active role in monitoring the Baryulgil operation. As the Chief Inspector of Mines said:

> Baryulgil has been, and will continue to be, a focus of attention as to how effective we are as a Department, in policing this problem.[74]

The standards applying at Baryulgil were themselves tightened in March 1978 when a limit of 2 fibres/ml was imposed.[75]

5.78 Woodsreef maintained that considerable improvements in dust control were achieved after their acquisition of the Baryulgil operation. These included the construction

of a pressurised room for bagging operations and the replacement and repair of mill doors and duct work. Mr Barwick gave evidence on behalf of Woodsreef that:

> the entire plant never reached Barraba standards because it was a very old mill, but we were working on upgrading the mill right up to the time that it was closed. It was just an ongoing operation. We were taking plant from Barraba that was redundant to the Baryulgil one and experimenting with that for improvement in recovery just as much as in the actual limiting of the dust.[76]

Woodsreef's evidence on this point was collaborated by references to ongoing improvements contained in a number of mine manager's reports,[77] and by the reports of the mines inspector (special duties) who visited Baryulgil frequently during this period.[78]

5.79 The first such inspection in August 1977 noted:

> This mine has been in operation since November, 1958, there has been some improvements in the equipment used but generally all is very old, and needs attention, was informed that new equipment is expected at the mine sometime at the end of 1977, from information received there are plans to make this into a major mine within a few years.
>
> Supervision at this mine needs to be improved to control their house keeping operation, if the recommended standard of 4 Fibres/cc is to be met . . . . Arrangements are in hand to upgrade the present dust extraction system to improve the sealing of shaking tables in the mill. This together with improved housekeeping should greatly reduce the present dust content within the mill area.[79]

The next survey, in December 1977, showed a marked improvement and went on 'Undoubtedly the upgrading of the dust extraction system at the mine, as recommended . . . has greatly improved the quality of air in and about the mill'.[80]

5.80 This trend continued and the February 1978 survey stated: 'compliance result had improved by 8% since the December survey'[81] although it was noted that the heavy thunderstorm which preceded the survey could have affected the results. The April survey again showed 'continued improvement'[82] which was confirmed in September. The inspector reported 'it is expected that this improvement will continue. All samples comply with the 2 fibres/ml of air'.[83] However, the last recorded reading for November 1978 shows some limited deterioration, although no area is recorded as 'Non-compliance'.

5.81 As with previous surveys conducted by the government agencies, the question arises: were these representative figures or did the management have prior warning of inspections and take steps to clean up the mill and to disguise the hazards?

5.82 In the Committee's view, the frequency of inspection during the final years of the mine's operation, together with increasing awareness of asbestos hazards, on the part of workers, inspectors and the public, make the possibility of any such cover ups far less likely. Moreover, the gradual improvement in dust levels can be traced directly to specific improvements implemented by the operating company, and recorded in the mine manager's reports.

5.83 Only one witness gave evidence which clearly conflicted with the above description. This was the manager himself. He suggested that it was impossible to control dust effectively in an open plant such as that at Baryulgil. Moreover, he maintained that production doubled as Woodsreef attempted to make the operation profitable, and that this increased the overall dust levels:

> Mr O'Neil — What about the conditions and the policy when Woodsreef took over? Did the policy of the mine owners change then and did conditions improve?
>
> Mr Burke — No. Once they took over the policy was to put much more material through the plant. They went from five to six tonnes an hour on average to 10 to 12 tonnes an hour on average. They increased the pick up capacity of the fibre extraction fan but they did nothing at all towards increasing the capacity of the dust extraction fan. This I mentioned to them in a letter but I got no reply to it at all.[84]

In the absence of collaboration from any other source, we are unable to make any determination on Mr Burke's allegation. Evidence form all other sources suggests that significant improvements were achieved in this period, under the close and frequent monitoring of the Mines Inspectorate.

THE AVAILABILITY AND USE OF RESPIRATORS

5.84 A great deal of evidence was given to the Inquiry on the issue of respirators. Much of it was conflicting and little was capable of being verified. Yet the issue is an important one. If respirators were readily available, properly maintained and worn routinely by workers in high dust areas, then the likelihood of those workers contracting asbestos-related disease, was substantially reduced. The policy of the operating company in supplying respirators is also important in determining whether it took reasonable steps to safeguard the health of the workforce.

5.85 One witness, Mr Olive, gave evidence that respirators were available in 1946, but this was not corroborated by any other witness. He was not able, however, to specify the kind of apparatus that was used. The weight of evidence suggests that respirators were issued from the early 1960s,[85] at the initiative of the operating company.

5.86 There is also a considerable weight of evidence that respirators were only worn infrequently. There are a number of reasons for this. First, since the workers only became aware of the hazards of asbestos quite late in the day,[87] it is understandable that they should see no strong reasons for wearing masks, except for their own comfort. As one witness put it:

> We did not know it was dangerous stuff going down into your lungs. It was just rubbish. The same as in a dust storm; you put a handkerchief up to your face; you do not think the dust is poison.[88]

5.87 Second, the respirators became clogged with dust within 5–15 minutes with the result that respirators were often discarded after a few minutes work.[89] Mr Burke gave evidence that 'you could replace the pads, but, as quickly as you replace the pads, on a hot summer's day they clogged up again.'[90] Conditions at the mine were often hot and humid, so that it was often very uncomfortable to wear a respirator.[91] This point is made not only by many of the Baryulgil workers themselves, but is also acknowledged in some of the correspondence from James Hardie's Head Office,[92] and in the Health Department records.[93] As a consequence, respirators were often hung loosely around workers' necks, rather than being used.[94]

5.88 Third, it is unclear how adequately workers were instructed in the use of respirators, or how effectively they were in practice stored and maintained. Dr Eva Francis of the Division of Occupational Health suggested that there had *not* been any respirator program at the mine[95] and this is consistent with the inspector's reports. For example, in 1970 it was noted 'Respiratory protection if worn, was a half face respirator in most cases not properly fitted.'[96]

5.89 Although Hardies issued instructions that respirators were to be worn, the fact is that generally they were *not*, and this must have been known not only to the mine manager, but also to head office. Not only were Hardies aware of the Department of Health reports, which sometimes made reference to the non-use of respirators,[97] but there were also Hardies own in-house reports. Those who visited the mine as part of the company's industrial hygiene program, would have seen at first hand, the reluctance of the work force to wear respirators. Mr Winters, for example, acknowledged that at the bagging operation:

> None of the men wear masks and as it is heavy physical work the men's breathing rate is very high, consequently their exposure is great.

and again

> dust levels during the bag shaking and hopper unloading processes are still alarmingly high, and although air wash dust masks have been installed to provide protection against these levels, they were not used for either operation during the testing periods. Although the wearing of masks could be made mandatory I doubt if it would be considered as effective dust protection measure as supervision on both tasks is minimal and probably the wearing of masks is proportional to the supervision time given to this task.[98]

5.90 Head office policy in relation to respirators was more rigorously pursued in the early 1970s as the company became increasingly concerned at the extent of the dust hazards.[99] However, as late as April 1972, an inspection by the Division of Occupational Health reported 'A dust respirator was used continually for bagging, but not in other sections of the plant or quarry.'[100]

5.91 It must be acknowledged that the day-to-day responsibility for ensuring that masks were worn, lay with the mine manager, rather than with head office. However, if Hardies had explained why it was necessary to wear masks, they might have obtained greater co-operation from the workforce. Further, for reasons stated above, and as Mr Winters acknowledged, the provision of respirators does *not* provide an adequate long-term solution. As the Merewether report had recognised as early as 1930, and as almost all the current asbestos regulations emphasise, protection through the wearing of respirators should only be seen as an inferior, and short term method of preventing exposure, and all efforts should be made to prevent the fibre getting into the air in the first place.

5.92 Brief comment should also be made of the inter-house letter of 15 March 1976 concerning protective equipment, sent from James Hardie and Co. P/L Head Office to G. Burke, Mine Manager. This letter noted:

> . . . Despite the foregoing half face dust respirators should as a rule only be issued where it has been shown, or where commonsense suggests there is good reason to believe, that the exposure exceeds 4 f/ml/shift; heretofore it has generally been the practice to issue a respirator to any man requesting it, this practice is now contrary to policy. It is desirable that the new policy should be introduced as quickly and as completely as possible, however, discretion should be used.

5.93 It has been suggested that the purpose of this directive was to ensure 'that no man had a respirator who has no need of it, but that any man who had need of a respirator had a respirator of an appropriate kind and that the same was properly cared for and maintained.'[101]

5.94 Nevertheless, given that by 1976 there was evidence that exposure levels well below 4f/cc could cause disease,[102] this policy, and the letter itself, were unfortunate in their implications for workers' health.

5.95 After Woodsreef took over the operation in September 1976, they maintain that respirators and dust masks were provided for use by all employees and that they were encouraged to wear them. It was Mr Burke's responsibility, as manager, to ensure that the masks were worn in high dust areas. However, Woodsreef were unable to provide any precise information as to how respirators were stored, maintained or issued. There is evidence in the mines inspector's reports for this period to suggest that masks *were* worn,[103] though whether they were worn other than during the inspector's visits, is not known. The mine manager suggested that, as in earlier years, because they were hot, uncomfortable, and frequently clogged, they were consequently often discarded.[104] Possibly the fact that employees by this time were becoming aware of the dust hazard, ensured their willingness to wear masks even when it was uncomfortable to do so.

5.96 Government inspectors also emphasised the importance of wearing respirators much more strongly in the last years of the mine's operation. On 3 March 1978 the Chief

Inspector of Mines wrote to the Manager at Baryulgil as follows:

> Presently dust concentrations are above this [the prescribed] level in the mill and until this lower required level is attained every person in the mill both employees and staff are required to wear [. . .] type respirator, agreed rest areas excepted.
>
> Any person sighted without a respirator will be regarded as having committed an offence against this Act and any such individual together with the mine manager will be proceeded against.

Had such a direction been issued and enforced many years earlier, the dust hazard to the workforce might have been considerably reduced.

THE PROVISION OF INFORMATION

5.97 Workers cannot be expected to play their part in minimising hazards if they are kept ignorant of the existence and nature of those hazards. A major factor which contributed to the health risks at Baryulgil was the failure to bring those risks to the attention of the workforce.

5.98 Hardies itself played no positive role in conveying to its employees a reasonable level of information as to the health risks of asbestos. No meetings were organised by Hardie's management to provide such information, no warning posters or letters were issued, there was no suggestion to workers (in later years) that they should not smoke because smoking increased the dangers. No instructions were sent to the mine manager directing him to bring the hazards to the attention of the workforce. Nowhere, in any of the internal company documents to which the Committee had access, was there any reference to the need to educate or inform the workforce or the Baryulgil community about the hazards of asbestos. Hardie Trading suggested that such information was at least implicitly communicated. Mr Kelso said:

> in my view, with regular dust counting going on and medical examinations, it is inconceivable that employees were unaware of the dangers of asbestos. In that period dust counts were taken very regularly right through from 1970 to 1976. It is just not possible that anybody did not understand that there were dangers in the usage and mining of asbestos. This was conveyed to them by the mine manager on many, many occasions.[105]

5.99 It is probably correct that the Baryulgil community did gradually gain some impression that the dust was harmful, around 1970. In that year Hardies began regular dust monitoring, and more vigorous attempts were made to reduce dust levels. There was also the X-ray program in the late 1960s and the medical monitoring scheme, which began in 1969, and around this time some of the workers also went to the Dust Diseases Board for health checks.

5.100 In 1969, Cyril Mundine, one of the long serving miners, died. His death was certified by the Dust Diseases Board as being asbestos-related, and his widow was awarded compensation. Although Mr Mundine had been living in Sydney, this news most probably filtered back to Baryulgil. The mine manager also gave evidence that, having himself become aware of the health hazards of asbestos in the late 1960s, he discussed the issue with the workforce, at least in very general terms. Finally, there was the evidence of the government agencies involved. Dr Francis of the Division of Occupational Health gave evidence that from 1972 at least, workers on jobs at which they were doing dust counts, were told of the reason for such monitoring.[106] However, the Division did not see itself as having any general role in providing information, and neither did the Mines Inspectorate. Indeed, the Chief Inspector of Mines expressed the view that it was the company's job, rather than that of the inspectorate to provide such information.[107]

5.101 Although the community gleaned from these various sources some appreciation that asbestos could be hazardous, it is understandable that their knowledge should remain

limited. It must be remembered that this was an unsophisticated aboriginal community with little consciousness of occupational health issues. Consequently, it was only in 1977 that the community gained a fuller understanding of the dangers to which they had been exposed. In that year, Andy Donnelly, who was regarded as a healthy member of the community, died. His death was believed by the community to be asbestos-related, since an autopsy revealed considerable amounts of asbestos fibre in his lungs. His death was followed by a visit from Matt Peacock, an ABC journalist. According to the community, he was the first person to explain to them in any detail, about the hazards of asbestos. It is an indictment of Hardies that although they were aware of the asbestosis hazard by the 1950s, neither then nor at any subsequent time did they attempt to communicate their knowledge to the workforce or to warn them of the dangers. The workers were simply left to glean that information elsewhere and to deduce the facts for themselves. As a consequence, particularly before 1970, workers saw little reason to wear such masks as were provided, or to take any particular precautions in handling the dust. If adequate information had been provided by Hardies, the risks of asbestos disease might have been considerably reduced.

WORKPLACE EXPOSURE TO CROCIDOLITE AND AMOSITE

5.102 All the asbestos mined at Baryulgil was chrysotile (in the serpentine group). Since serpentine asbestos is not found together with amphibole varieties, one would not expect the workers at Baryulgil to have been exposed to crocidolite (blue asbestos) or amosite (brown asbestos). However, the Aboriginal Legal Service argued that used bags, apparently from South Africa, contained a residue of crocidolite and amosite. These types of asbestos are recognised as being even more dangerous to health than chrysotile and, in particular, they may be more likely to cause mesothelioma.[104]

5.103 Suggestions that workers had been exposed to amphibole asbestos were denied by Mr Kelso, who stated that he had researched the records of all shipments of crocidolite from South Africa between 1953 and 1976 and found that all had gone to the group's New Zealand plant.[109] He concluded:

> It would seem to me very unlikely that any South African blue asbestos bags were used at Baryulgil. However I must say that South African blue asbestos shipments were consigned to other manufacturers, apart from the Hardie group before 1953. I have to admit that it is possible that some of these bags might in fact have been re-used at Baryulgil but I cannot find any positive evidence to support that.[110]

However, a Tariff Board report in 1955 shows that shipments of South African amphibole asbestos *were* being used by Hardies plants in Australia and it is therefore possible that used bags with this residue could have been present at Baryulgil.[111]

5.104 In support of the Aboriginal Legal Service position, was the evidence of a number of Aboriginal and non-Aboriginal workers, all of whom recollected using bags with South African labels which had residues of brown or blue asbestos.[112]

5.105 More concrete evidence is available in the form of a lung tissue sample taken at autopsy from Mr J.S. Waghorn. Mr Waghorn worked at Baryulgil for many years, starting in 1953. There is no alternative occupational history to suggest that he was exposed to high levels of crocidolite elsewhere.[113] Yet examined by analytical Transmission Electron Microscopy indicated far higher levels of both serpentine and amphibole asbestos than those found in the lungs of ordinary city dwellers. The results showed the presence of the following:[114]

	Millions of fibres/gram dry tissue >2 m in length	
Asbestos Type	*Sample*	*Upper limit Sydney male population*
Chrysotile	16.0	0.5
Amosite	12.5	0.5
Crocidolite	5.5	1.0

5.106 These findings of high levels of crocidolite and amosite, support the views of the workforce that they were exposed to significant qualities of amphibole asbestos fibre, contained in contaminated bags delivered to the mine.

ASSESSING HARDIE'S RESPONSE

5.107 According to Hardie Trading:

> While it had responsibility for the management of the Baryulgil mine, the operating company's policy and objective for mine management was to keep dust levels within limits recommended by the various authorities and agencies. In fact the operating company adopted self-imposed dust level objectives which were stricter than the official recommendations or requirements.[115]

Specifically, Hardies followed the 1938 recommendation of the American Conference of Governmental Occupational Hygenists (ACGIH) in accepting a level of 5 million particles per cubic foot (5 mppcf) 'as a dust control objective'. When the New South Wales Government finally established 5 mppcf as a statutory limit under the Mines Inspection Act in 1964, Hardies responded by 'moving towards and adopting a self-imposed objective of approximately one half of this'. Hardies went on to adopt an internal standard of 4 fibres per cubic centimetre (4f/cc) in 1969 and 2f/cc in 1973 — the year that the legal limit under the Mines Inspection Act became 4f/cc.[116]

5.108 In this section two central questions are addressed. First, how aware of the hazards of asbestos exposure were Hardies; or should they have reasonably been expected to be aware, during the period they operated the Baryulgil mine? Second, given that knowledge, how much should Hardies have done, as reasonable employers, to reduce the dust hazard and protect the health of their workforce at Baryulgil? The focus is on events after 1953, when Hardies bought out Wunderlich's 50% holding in Asbestos Mines Pty Ltd, and obtained full control of the operating company.

Awareness of the hazards

5.109 Hardies critics point to the early evidence that asbestos caused disease[117] and in particular to the Merewether and Price Report to the British Parliament in 1930 which stated:

> that the inhalation of asbestos dust over a period of years results in the development of a serious type of fibrosis of the lungs.[118]

As noted earlier, this was followed in 1938 by the ACGIH recommendation that exposure be limited to 5 mppcf, and this was adopted as the legal standard in Victoria in 1945.[119]

5.110 Could Hardies have been unaware of these important developments by the time they took over Wunderlich in 1953? Describing the period between 1944 and 1952, Mr Justice Jacobs has suggested that in Australia there was:

> an almost total unawareness on the part of the medical profession, public health authorities, and industry, of the hazards of asbestos or the need to take precautions in situations of exposure.[120]

However, while it may be correct that the public, doctors and even industry generally, remained largely ignorant of the hazards, this was not necessarily true of James Hardie and its subsidiaries.

5.111 As a major user of asbestos products, and as an industry leader, Hardies had more reason than most, to take a particular interest in asbestos disease[121]. As Professor Gandevia in his evidence pointed out:

> there was certainly grounds amongst those with any connection with the asbestos industry for being concerned about the hazards of asbestos dust, at far higher levels than we would consider important now, back in the 1950s. But they would need to be fairly concerned and involved to have that awareness.[122]

Hardies were almost certainly amongst those who were 'concerned and involved'. As a major asbestos manufacturer, they almost certainly maintained close contact with other asbestos companies in North America and the United Kingdom. It seems unlikely that they would not have gained information on known asbestos hazards either from those companies or from journals readily available in Australia. By the 1950s Hardies would almost certainly have been well aware of the major British report of 1930, of the resulting British regulations of the ACGIH standard and of the 1945 Victorian regulations.[123]

5.112 Presumably conscious of their obligations under liability insurance[124] and mindful of pending litigation, Hardies were not willing to provide the Committee with information concerning internal discussions or reports it may have had relating to asbestos disease in the past. However, Mr Kelso, on behalf of Hardie Trading, did concede that:

> Asbestosis was known in the group as a serious problem in the 1950s, and action began in that time and continued to mount until the mine was closed.[125]

5.113 There is also evidence that in 1956, Hardies commissioned Dr Maurice Joseph, a distinguished Sydney chest physician, to conduct surveys of a number of Hardie employees, that he diagnosed a number of them as suffering from asbestos-related disease, and that his report was presented to Hardies in 1957.[126]

5.114 In summary, by 1953, official studies had been available for many years, documenting that asbestos posed a serious health hazard. These should have been well known within the asbestos industry itself. Moreover, asbestos was the subject of legal regulation in the United Kingdom and Victoria. Hardies itself acknowledge that asbestosis was known as a serious problem in the 1950s. In 1956, a study of their employees amply confirmed this fact.

5.115 How then, could workers at Baryulgil (or indeed elsewhere) be exposed to such high and potentially fatal asbestos dust levels? Why was no decisive action taken to safeguard their health? The answer *in part* is that while the early studies linked asbestos exposure with worker disease, they did not indicate the relationship between exposure levels and the volume of the disease, nor did they identify all relevant diseases. As the recent Ontario Royal Commission has pointed out:

> This 1930 (Merewether and Price) report dealt only with asbestosis; the linkage between asbestos and lung cancer was not suggested until the mid-1930s, and was not systematically demonstrated until Doll published his seminal work in 1955, and was not widely appreciated until the Selikoff study was published in 1964. Mesothelioma was not clearly linked to asbestos exposure until the work of Wagner, published between 1960 and 1965.[127]

The essential point is that we should not judge behaviour in the 1950s against the knowledge we have acquired only much more recently. Up until the 1960s, it was known that asbestosis was likely to occur in those who had been exposed to heavy doses of

asbestos in the early years of the industry. However, it was *not* known that quite low doses might have grave consequences 30 or more years after first exposure.[128] Only in the 1960s did it become apparent that 'the reduction of heavy exposure that led to early death would reveal such slowly developing diseases as mesothelioma and bronchogenic carcinoma with increasing clarity.[129]

The adequacy of safety measures 1944–1970

5.116 Were Hardies blameless in taking only a very limited interest in dust control at Baryulgil prior to 1970? Was so little known about the *levels* of asbestos which were capable of causing disease that Hardies behaviour was reasonable in the circumstances, or should a reasonable employer, even in the 1950s, have taken far more positive action to control the dust hazard?

5.117 In the Committee's view, Hardies could and should have done far more to achieve dust controls at Baryulgil, and to safeguard the health of the workforce. It is true that not until the mid or late 1960s,[130] was it known that levels of dust much lower than the 1938 ACGIH standard of 5 mppcf would cause asbestos disease. Nevertheless, judged by the knowledge available by the 1950s, and in terms of the ACGIH standard itself, Hardies response fell short of that which could be expected of a reasonable employer.

5.118 The levels of asbestos that were documented as causing asbestosis before 1930, and upon which the ACGIH standard was based, were indeed heavy. For example, Selikoff and Lee have stated that:

> Before 1930, conditions in the mines, mills, and factories were largely uncontrolled so that some heavy exposures occurred. Eyewitnesses speak of being unable to see more than a few feet, for instance, because of the amount of dust in the air.[131]

In his testimony before the Ontario Royal Commission, Dr J.C. McDonald described historical conditions in the Quebec mines in these terms:

> (Y)ou couldn't see the workers . . . literally couldn't see them. They were in a cloud that you couldn't measure . . . I'm not speaking of throughout, but I'm speaking particularly of the bagging department, where it was sometimes a habit of even getting into a bag and jumping on it, to pack the stuff in.[132]

5.119 There is a striking similarity between these descriptions and the accounts of miners at Baryulgil who equally describe working in clouds of dust and being barely able to see each other from a distance of a few feet.[133] The high levels of asbestos that were known to be hazardous in 1930, were probably in the same range as those to which the Baryulgil workers were exposed in the 1940s and 1950s, certainly until the new mill was built in 1958. As noted earlier, the precise levels of exposure in these early years will never be known, but there is little doubt that it was high, and often exceeded the then recommended exposure limit of 5 mppcf. It should have been clear to Hardies that such levels of exposure were capable of producing a substantial incidence of asbestosis. It should also have been clear that there was technology available capable of substantially reducing those dust levels.[134] However, Hardies response to the dust problem at Baryulgil in those years, was apparently minimal.

5.120 Hardie Trading have emphasised that 'in the early days it was thought that perhaps just good ventilation would be satisfactory'[135] to control the dust hazard, and they point out that the 1931 British regulations did not specify any maximum exposure level. However, the 1931 regulations *did* emphasise the need for local exhaust systems[136] (hardly a central feature of the old mill at Baryulgil), and they further stressed that bags should be made of impermeable material. This was a most important recommendation. We have noted that conditions in the bagging room at Baryulgil posed a serious hazard, and that the use of hessian bags until late 1973, seriously exacerbated that problem. Had the company

heeded the recommendation contained in the 1931 regulations then a considerable reduction in dust levels in the bagging area might have been achieved many years earlier.

5.121 The Merewether report in 1930 had also recommended the use of portable vacuum cleaners, rather than sweeping or blowing, as a way of reducing dust levels. Yet for many years fibre was simply swept off floors and ledges and compressed air was sometimes used to blow fibre off mill machinery and walls. The result was to spread fibre and dust throughout the workplace. This hazard would have been avoided simply by vacuuming the dust, as recommended by the Merewether report. It was only in 1969, that a vacuum cleaner was purchased for Baryulgil, and only after this had been urged upon the company by the government inspector. When it was introduced, it produced 'decidedly good results'.[137]

5.122 Hardies also suggested that the 1930 regulations were directed essentially at the textile industry, and by implication that there was no perceived hazard at that time in the mining or milling of asbestos. This too must be rejected. As early as 1930 I.L.O. Occupational Health Encyclopaedia stated 'all processes *from extraction onwards* unquestionably involve a considerable hazard.'[138] (emphasis added)

5.123 It should also be noted that the results of the 1956 survey, conducted by Dr Joseph, indicated a substantial incidence of asbestosis amongst the group tested[139]. These workers were not Baryulgil employees. Since conditions at Baryulgil were, by all accounts, far worse than elsewhere in Hardies operations,[140] it follows that Hardies should have been on notice from this time, that lower levels of dust, than those to which Baryulgil workers were exposed, could cause asbestosis.

5.124 In the period from 1959–1970 conditions were undoubtedly better than they had been in the old mill. Even in this period, workers were exposed to high dust levels by contemporary standards, but quite how high these doses were, will never be known. The measurements taken by the government agencies were probably substantial underestimates, for reasons stated earlier[141]. The only other evidence is the actual account of the workers, and the report of Mr Reeve's visit in 1966. The picture of the mine that emerges prior to 1970, is of generally dusty conditions, which at least in some parts of the mill, on some occasions, exceeded the then recommended exposure limits. Whether dust levels during this period were *generally* excessive, judged by the standards of the 1950s and early 1960s, is unclear. What can be said is that Hardies made very little effort to find out. They themselves took no dust readings during this period. Indeed until 1970, Hardies made no systematic effort either to ascertain how high dust levels were or to reduce them. Nor, until 1969, was any program introduced for monitoring the health of the workforce.

5.125 The principle responsibility for making arrangements to protect workers from dangers to health clearly lies with the employer, not with the government inspectorates. It was an abdication of this responsibility for Hardies to rely on the very infrequent visits of the government agencies, rather than upon their own initiatives to ensure the health and safety of the workforce.

The adequacy of safety precautions 1970–1976

5.126 By the mid or late 1960s it had become apparent that much lower levels of exposure than had previously been thought, could cause asbestosis.[142] In 1964 an international conference on the Biological Effects of Asbestos was conducted by the New York Academy of Science. The proceedings were published the following year. The conference suggested that the ACGIH standard of 5 mppcf was based on seriously flawed assumptions and that much lower levels of exposure might well constitute a health hazard.

5.127 In response to this news, Mr F.A. Page, Director of James Hardie & Co. Pty Ltd, circulated a letter to all managers of subsidiary companies in May 1965.[143] The letter

alerted them to the findings of the conference and informed them of the possibility that State Health Departments might conduct medical investigations into the effects of asbestos exposure on workers. The purpose of the letter was to ensure that the Federal Personnel Manager was kept informed in detail of any such programs and their results. Mr Page concluded:

> Quite apart from any legal requirement the company accepts the moral obligation of ensuring that the health of its operatives and staff is adequately safeguarded. To this end, the quest for better dust control and working conditions will continue.

5.128 The quest for better control did continue quite rapidly in certain parts of Hardies operations. Speaking at the First Australian Pneumoconiosis Conference in February 1968,[144] Mr Gilbert of Hardies, described a number of engineering controls that had been introduced in various of Hardies factories throughout Australia in the previous two years. He referred particularly to precautions now adhered to at Hardies Victorian factory where:

> the asbestos received in jute bags is handled only once by us. It comes on pallets direct from the wharf, is emptied into a vented hopper and this is the only handling point. From there it is treated, conveyed, weighed and mixed without being handled by any human. All this is done in fully enclosed areas which are under negative pressure and if any leakage does occur, it occurs inward. All our new plants have the same facilities but we are striving to modify some of our older plants to instal this equipment; we haven't completed the task although there are very few points left.[145]

5.129 This description may be contrasted with the methods used at Baryulgil, where (as noted in the inspector's report of 1969[146]) manual methods were used in filling, weighing, topping up, transporting and loading bags and in a number of other operations, each of which generated substantial amounts of asbestos fibre.

5.130 The hazards at Baryulgil were not unknown to Hardies head office by this time. In 1966, Hardies chief draftsman, Mr Reeve, had visited the mine and drawn attention to a number of problems previously referred to. Yet Baryulgil, which undoutedly had (and continued to have) a worst dust problem than Hardies other operations, was not to share these technological advances for some considerable time. Nor was it made subject to an industrial hygiene survey until 1970, or to the internal medical surveillance scheme until 1969, even though these programs were first introduced in 1967 and had been preceded by internal dust checks in Hardies Sydney plants for many years.

5.131 It is hardly surprising that a mining and milling operation such as Baryulgil should present a greater dust problem than Hardies various factories. What *is* surprising is that Baryulgil, with its known problems, should have had such a low priority. Even accepting that Hardies could not implement medical and industrial hygiene programs simultaneously in all their operations, it seems curious that the operation with the worst problems should have been amongst the last to receive attention.

5.132 Even after the introduction of dust surveys and the introduction of some dust controls in the early 1970s, Baryulgil continued to have a far worse hazard than any other Australian operation controlled by the Hardie group. For example, Dr McCullagh commented that in February 1983, 31% of sampling stations at Baryulgil had a count of less than 4f/cc while 15% had a count of above 12f/cc — while throughout James Hardie & Co. Pty Ltd, 90% of stations were under 4f/cc and only 2% above 12/fcc. In mid-February 1974, Dr McCullagh made his own inspection of the Baryulgil mine. His report began:

> The control of emission of asbestos into the workplace air at Baryulgil is far poorer than anywhere else — nonetheless it is to be recognised that it has improved greatly over the years.

A comparison of dust sampling stations as at 18 February 1975 again showed that the dust

level problem was clearly worse at Baryulgil than any other James Hardie subsidiary operation, with 70% of dust measurement stations over the 4f/cc standard.

5.133 After the introduction of dust monitoring at Baryulgil in 1970, there can be no doubt that Hardies took a much closer interest in dust control. This is apparent from the mine manager's reports[147] and from the accounts contained in the reports of the District Inspector of Mines, who in July 1971 found 'a noted improvement in working conditions' and in March 1973 reported that 'progressive steps have been taken within the milling area to reduce dust hazard'.

5.134 Some substantial improvements were apparently achieved. For example, the introduction of the water spray at the tailings hopper resulted in a reduction of the former dust levels, although it was never more than partially successful due to lack of water pressure.[148] The manager also designed a suppression unit to fit on the drill, which minimised dust emissions during the drilling operation.[149] An exhaust fan was fitted behind the jaw crusher in 1972, and a canopy fitted around the fan to improve dust extraction. In the processing mill, several wall fans were fitted at various levels and all entrances were closed off with heavy duty plasticised material so as to create an enclosed area and thereby improve the efficiency of the extraction fans. Conditions in the screen house also improved with the progressive enclosing of the screen and the elimination of leakage points. Thus by 1975 the screens were fully enclosed. General ventilation of the screen house was also gradually upgraded as more power became available at the mine.[150]

5.135 More generally, although the number of dust stations registering less than 4f/cc apparently increased by only one (from two in September 1970 to three in August 1976)[151] between 1970 and 1976, dust counts (even though many remained above 4f/cc) did come down over that period. Thus Dr McCullagh was able to state in May 1971 that:

> When the mine was initially surveyed in September 1970 only 2, or perhaps 3, or your 9 dust sampling stations had a level under 12 fibres per ccm; now 5, or perhaps 6, do. Initially, 3 stations had a count of over 40f/pccm; now it seems none does.[152]

The Departments of Health and Mines reports from late 1972 onwards, (subject to the provisos mentioned earlier) also suggest a very marked improvement in exposure levels.

5.136 However, as Table 3 indicates, improvements were not always sustained, and in some areas, were only achieved long after the original problem had been identified. Two operations in particular continued to produce high dust levels despite repeated calls for urgent action, from both the Medical Officer and the Industrial Hygiene Engineer. These areas were the dust collector sock level, and the bagging operation.

5.137 The first documented expression of concern with dust levels at the sock cleaning operation was in February 1966, when the mine was visited by E.G. Reeve, Chief Draftsman. He remarked:

> attention was drawn also to the process of cleaning the dust socks. This was obviously the greater hazard and requires attention *even more urgently* than the final disposal of the dust.[153] (emphasis added).

In 1968, speaking at the pneumoconiosis conference, Mr Gilbert announced Hardies decision to require the mechanical shaking of dust socks. Apparently, no significant action was taken following Mr Reeve's visit, for the first dust survey, in September 1970, registered a dust level there of 245f/cc, which had risen to 1,760f/cc by December. From September 1970 on, references to the urgent need for the full enclosure and mechanical shaking of the dust collector sock, became almost routine in the reports of Mr Winters. He raised it again in his reports of June.

5.138 In July, August and September 1971 and in February 1972, V. Gerrard, in the absence of Dr McCullagh, also recommended enclosure of the building and the

installation of a device for manually shaking the dust socks from a point external to the building. As Winters had stressed many times previously, this was 'urgently needed'.

5.139 New socks apparently alleviated the problem and reduced dust levels substantially, but dust levels again began to rise with sock age.[154] In June 1972 Winters again recommended 'dust socks should be fully enclosed and mechanically shaken' but this produced no early results. Although new terylene socks were installed at the dust collector, the survey of 31 January–1,2 February 1973 reported that the enclosure and mechanical shaking of socks would probably soon be required by regulation.[155] Finally, in February 1974, some eight years after Mr Reeve's initial expression of the need for urgent action, McCullagh was able to report the arrival of automatic sock-shaking equipment on site, which 'awaits only the arrival of the electrician from Grafton to instal it.'

5.140 Throughout this period, workers visited the socks for only relatively brief periods in order to shake them. However, there is no doubt that 'this area would always have had an excessive exposure for the man banging the bags or emptying the dust, even taking into account of the short time spent doing this.'[156]

5.141 The other hazardous operation which gave rise to repeated requests for better dust control technology, was the bagging operation, and in particular the loading of bags, which resulted in extremely high dust levels. The hessian bags which were used until late 1973, permitted the escape of asbestos fibre (and at this stage in the operation, the dust involved would have been almost entirely asbestos fibre, unadulterated by serpentine dust). It may be noted that as early as 1930 the Merewether Report referred to the need for sacks to be impermeable to dust.

5.142 The extent of the hazard becomes apparent from the various reports that are available. For example, Mr Winters, in his report of August-September 1971, noted:

> This operation is an extremely dusty one. It is performed by six men each week and takes about one hour to complete. None of the men wear masks and as it is heavy physical work the men's breathing rate is very high, consequently their exposure is great. Probably the one redeeming feature during the testing period was the stiff breeze blowing which dispersed fibre away from the loading area. Without this dust levels would have been many times greater than the 29.0 fibres c/c recorded. Therefore, it is imperative that Baryulgil asbestos be packed in impervious dustproof bags as soon as possible. The fabrene bags available from Brisbane would be ideal.

Similarly, V. Gerard (acting in McCullagh's absence) in his report of February 1972, noted that the bagging operation 'produced one of the few cases of asbestosis associated with the mine' and urged that the mine manager's request for fabrene bags, be granted.[157] This suggestion was repeated by Winters in his report on the January 1972 dust count.

5.143 By June 1972 a new type of paper bag was under test 'which should eliminate these high counts'. In early 1973 it was reported that 'paper bags were being investigated as well as plastic lined hessian bags'[158] and by late 1973 or early 1974 plastic linings to jute bags were being used.[159]

The importance of costs

5.144 Hardies reluctance to implement such major dust control measures (e.g. at the sock shaker), where substantial expenditure was involved, may be attributed to their limited commitment to the future of the mine. This is a recurrent theme in correspondence from both Dr McCullagh and Mr Winters. Mr Winters report in September 1971 is typical. It began:

> The Mine Manager is well aware of the necessity for controlling asbestos dust. However, the dust control programme for Baryulgil has been hampered through lack of a decision by management as to the future and likely life of the mine. Consequently, all modifications

> performed to reduce dust levels have been stop gap measures and planning for major modification has not been possible.

and in his summary of recommendations, Winters stresses:

> First and foremost a direction by management as to the life expectancy of the mine is required so that the scale of the dust reduction programme can be tailored to suit this.[160]

5.145 These observations are borne out by the mine manager, Mr Burke, who gave evidence that the projections concerning the life of the mine were often quite short. In his view, this often minimised the prospect of major capital expenditure on dust suppression techniques and equipment.[161] He described many of the dust control methods as being 'band-aid'[162] and estimated that adequate dust control methods would have cost between $70,000 and $80,000.[163]

5.146 The importance of cost in Hardies decisions whether to implement dust controls, is also borne out by the cryptic statement in a letter of 27 July 1972, from the Chairman of the Dust Diseases Board to the Director of Occupational Health. The letter refers to a proposed inspection at Baryulgil:

> in respect of claims that certain dust counts previously taken by the Division were excessive and that the modifications which had been suggested on the basis of *those counts were of such an expensive nature that might require closure of the mine*. (emphasis added)

Technological limitations to effective dust control

5.147 One further question remains, namely how far were Hardies constrained by technological limitations, from implementing dust controls at Baryulgil, i.e. was there any other way of doing it *at the time*? Hardie Trading were unable to provide very much information except to suggest that the building of both the old and new mills probably represented the 'state of the art' at the time.

5.148 Although no precise evidence was given to the Committee on this issue, it is likely that substantial improvements could have been achieved using available technology. The problem of dust control, and means of addressing it, were well known by the time the first mill was built. For example, the Western Australian Mines Inspectorate stated in its report of 1945:

> The solution of the dust problem resolves itself into the willingness of the Management to accept the responsibility of seeing to it that the various machines release as little dust as possible into the atmosphere . . . Anyone constructing a dry treatment plant of any description must realise that dust control is the major principle around which the rest of the plant is designed.[164]

In 1947 W.E. George of the Broken Hill Mining Manager's Association stated:

> It may be said with some degree of certainty that there is enough knowledge of practical methods of dust control to enable almost any operation having a potential dust hazard to be carried out without exposure of workers to dangerous dust concentrations.[165]

He supported his claim by referring to the experience at Broken Hill, where pneumoconiosis had been a problem before 1920. Dust control and careful monitoring had ensured that 'no case of silicosis had been found amongst miners who started work in these fields after 1922'.[166] There is no reason to believe that technology of proved effectiveness in dealing with coal dust (as at Broken Hill) could not be applied and adapted to dealing with asbestos fibre.

5.149 A number of papers on dust control were delivered at pneumoconiosis conferences in the 1950s, and in 1968 at a pneumoconiosis conference held at Sydney University, and dust control and monitoring[167] were considered in detail. J.D. Smith presented a paper once again emphasising the importance of dust suppression at its source, use of wet methods, and of dust collectors. He concluded that:

it can be safely claimed that there is sufficient information in the technical literature . . . to design an efficient dust collecting system[168]

5.150 The use of impermeable bags and of 'an exhaust draught effected by mechanical means' had been referred to in the British regulations as early as 1931, and by 1966 Mr Reeve, Hardies draftsman is on record as observing that the only real solution at Baryulgil probably lay in wet collection or in one of the more sophisticated dry collectors.[169] The former mine manager also gave evidence that the dust problem was capable of control.[170]

5.151 It seems reasonable to conclude that any company engaged in mining or quarrying would have been aware of the issue of dust suppression, and might be expected to have investigated and instituted available suppression measures that were well established in N.S.W.

Summary

5.152 In the period from 1953–1976, during which Hardies controlled the Baryulgil operation, they only infrequently achieved their own stated objectives in relation to dust control, and they often breached the legal limits which applied after 1964. Before 1970 they made no systematic effort either to monitor or control the dust hazard. After 1970 they did implement a number of controls and dust levels were progressively reduced. However, the improvements were often delayed, piecemeal and spasmodic, and were insufficient to bring dust levels in some areas within the legal or recommended levels, or to provide the degree of dust control achieved elsewhere in the organisation. Even in August 1976, shortly before Hardies sold the Baryulgil operation, they had not managed to achieve compliance with the legal standard at three of nine dust stations monitored.

5.153 Many factors contributed to this disappointing record, but in particular managerial lack of concern (before 1970) lack of commitment to the future of the mine, inadequate funding and failure to involve the workforce or to inform them of the dangers were largely to blame.

5.154 Perhaps the most fundamental and obvious conclusion drawn from all this, (and one to be more fully explored in Chapter 7) was made succinctly by Professor Gandevia. In his view, 'the evidence indicated that the exposure was unquestionably excessive by modern standards for the miners and in the asbestosis producing range. There is no question about that.[171]

ENDNOTES

(The bulk of the Endnotes to this Chapter refer to documents submitted to the Commitee and reproduced in the Transcript of Evidence at pages 843 to 894 and pages 2909 to 3016).

1 Transcript of Evidence, p. 1387.
2 Transcript of Evidence, p. 1388.
3 Transcript of Evidence, p. 1393.
4 Transcript of Evidence, p. 1397.
5 On 30 May 1984, the Chairman requested Hardie Trading (Services) Pty Ltd to provide a detailed factual description of the operations at Baryulgil. Although the group presented additional information and clarified a number of points about the mining operation, it did not supply the Inquiry with a comprehensive description.
6 Transcript of Evidence, p. 2884.
7 In his evidence of 7 February 1984, Mr Sheather advised the Committee that the conveyor belts at the mill were covered to protect the ore from weather, although they were not covered at the sides. It is not clear exactly how many belts apart from No. 3, which transported the ore into the hazmag crusher, were built like this. (Transcript of Evidence, p. 300.)
8 Transcript of Evidence, p. 872.

9 Transcript of Evidence, p. 14.
10 Transcript of Evidence, p. 197.
11 Transcript of Evidence, p. 1478.
12 Transcript of Evidence, pp. 178–9.
13 See, for example, inter-house letter from V. Gerrard to Distribution, 7 February 1972, which refers to billowing clouds of dust coming from the mine. He says 'we have, on previous occasions, obtained counts of about 100f.cm_3 here' i.e. very high levels of asbestos *fibres* (not merely dust) were recorded in dust clouds.
14 Survey of 22 March 1960 and report of 24 May 1960 by T. Jones, Scientific Officer of the Division of Occupational Health.
15 Letter from Dr E. Francis to Dr W.A. Crawford, Division of Occupational Health and Radiation Control, 18 March 1976.
16 See Chapter 3.
17 Transcript of Evidence, p. 2302.
18 Transcript of Evidence, p. 185.
19 Transcript of Evidence, *ibid.*
20 Transcript of Evidence, pp. 279 and 282.
21 Transcript of Evidence, p. 300.
22 See generally, Transcript of Evidence, 6 February 1984.
23 Transcript of Evidence, 10 Feburary 1984.
24 Transcript of Evidence, p. 300.
25 Transcript of Evidence, p. 181.
26 Transcript of Evidence, p. 181.
27 See for example, inter-house letter from S.F. McCullagh to Mine Manger, Baryulgil, 6 November 1970. This refers to the September 1970 survey as being the first to be carried out at Baryulgil.
28 Mine Manager's Report for fortnight ending 6 August 1968.
29 Mine Manger's Report for fortnight ending 6 August 1968.
30 Measurements taken prior to 1969 are all in terms of millions of particles of dust per cubic foot, measured primarily by midget impinger. An unofficial standard of 5 million particles per cubic foot (5mppcf) as adopted from some years, but this did not become a legal standard in New South Wales until 1964.
31 Report of Inspection, 17 May 1960.
32 Transcript of Evidence, pp. 871 to 874.
33 See Chapter 6.
34 Report of visit to asbestos mine, Baryulgil, 28 February 1966.
35 Letter to the Committee, received 12 December 1973.
36 As noted at paragraph 1.29, these may not be a complete record.
37 See, for example, inter-house letter from S.F. McCullagh to Local Manager, Baryulgil, 4 July 1973.
38 See, for example, letter from Dr E. Francis to Dr W. Crawford, 13 March 1976.
39 See further 'Membrane Filter Method for Estimating Airborne Asbestos Dust' NH & MRC 1976, Section 8.
40 The dust sampling stations were located throughout the mining operation. There were four dust stations in the main mill building itself. They were at the No. 1 screen, between Nos. 1 & 3 screens, at No. 7 screen, and in the bagging area. These four dust sampling stations were in a relatively small building which was of open plan design. Altogether there were twelve or thirteen dust sampling stations and nine of them were in the vicinity of the mill. There were dust sampling stations at the loading dock, the dump area, and at the drilling face in the quarry. Mr Lawrence, for the ALS (Transcript of Evidence, 23 August 1984) argued with some justification, that the monitoring program gave a very good general impression of work place conditions.
41 See further 'Membrane Filter Method for Estimating Airborne Asbestos Dust' NH & MRC 1976, Section 8.
42 See, for example, inter-house letter from S.F. McCullagh to Mine Manager, Baryulgil, 20 May 1971; Industrial Hygiene Reports by J. Winters, 10 May 1972 and 2 November 1972.
43 See the National Health and Medical Research Council (NH & MRC) Recommendation,

adopted in May 1969 whereby 'the long term (close to eight hours) average asbestos concentration of air breathed by the worker should not exceed four fibres per millilitre of air, as measured by the membrane filter method..' It may be noted that in the United Kingdom, the maximum permitted level under regulations made in 1969, was 2f/cc, and that Hardies adopted this as their own internal standard as from 1973.

44 See Table 3 (Appendix IV).
45 See Chapter 1.
46 'Report on the Industrial Hygiene Survey of Asbestos Mines Pty Ltd, Baryulgil, 14–17 Sept. 1970', 20 October 1970.
47 *Ibid.*
48 That is, the average exposure of a person working in the mill as measured by a personal sampler.
49 Inter-house letter from S.F. McCullagh to Mine Manager, Baryulgil, 6 November 1970.
50 Inter-house letter from S.F. McCullagh to Mine Mangager, Baryulgil, 12 January 1971.
51 See, for example, dust surveys in June and July 1971, February 1972, 30 May 1972 and February and April 1975. See also interhouse letter from S.F. McCullagh to Mine Manager, Baryulgil, 20 May 1971.
52 See, for example, report of 11 June 1971.
53 For example, surveys of 30 August–3 September 1971, 9 May 1973, 24 May 1973, and 28 June 1973.
54 See, for example, reports of surveys 31 January 1973–1 February 1973, 24 May 1973, 28 June 1973 and 14 September 1976.
55 For example, 'dusty feed' in the May 1973 report.
56 Most notably, at the mill tailings hopper following the introduction of the water spray, and at the bagging area following the introduction of fabrene bags.
57 For example, surveys of July, August 1971, April, May 1972.
58 For example, dust station 4, 26 August 1971; stations 5, 9 and 13 on 30 August 1971 to 3 September 1971. See also May 1973 and June 1973 reports.
59 Inter-house letter from S.F. McCullagh to Mine Manager, Baryulgil, 29 February 1972.
60 Inter-house letter from V. Gerrard to Head Office, 3 February 1972.
61 Inter-house letter from V. Gerrard to Distribution, 7 February 1972.
62 Personal samples in September 1974 were all below 4f/cc. However, the report states that some of the measurements 'do not give a true indication of count due to very heavy filter loading. True count probably many times higher than figures shown.'
63 For reference to the Inspector's reports, see Chapter 6.
64 Division of Occupational Health, report of 2 October 1970 by C.R. Simpson and A.T. Jones.
65 Letter from Chairman, Dust Diseases Board, to Director of Occupational Health, Lidcombe, 13 October 1971.
66 Report of E. Francis and A.T. Jones, Division of Occupational Health, 14 June 1972.
67 Report of E. Francis and A.T. Jones, Division of Occupational Health, 26 October 1972.
68 Report of Inspector of Mines (Special Duties), 1 Sept. 1972.
69 Report of Inspector of Mines (Special Duties), 1 Feb. 1973.
70 Inter-house letter from Dr S.F. McCullagh to Mine Manager, Baryulgil, 6 November 1970.
71 Letter from Dr E. Francis to Dr Crawford, 18 March 1976.
72 Inter-house letter from Dr McCullagh, 21 Feb. 1974.
73 Letter from D.K. Barwick, Woodsreef Mines, to Committee Secretary, 4 November 1973.
74 File Note, R.F. Marshall, Chief Inspector of Mines, 2 February 1979.
75 See further paragraph 4.19.
76 Transcript of Evidence, p. 2142.
77 Transcript of Evidence, p. 2125–30.
78 For details, see Table 2 (Appendix IV).
79 Department of Mines Minute, A.J. Slater, 17 October 1977.
80 Department of Mines Minute, J.D. Collins, 18 January 1978.
81 Department of Mines Minute, J.D. Collins, for Feb. 1978.
82 Department of Mines Minute, J.D. Collins, 16 May 1978.
83 Department of Mines Minute, J.D. Collins, 16 November 1978.
84 Transcript of Evidence, p. 188.

85 One witness (Mr Olive, Transcript of Evidence, pp. 261 and 263) gave evidence that respirators were available in 1946, but this was not corroborated by other witnesses. See Transcript of Evidence, p. 159; Mr Burke, p. 218; and Mr Hinde, pp. 289–90. The Department of Mines report from S.F. Mulholland to the Director, Division of Occupational Health, 1 Sep. 1960, noted that the mine manager had made arrangements to have a notice posted requiring a dust mask to be worn in the bag room.
86 Transcript of Evidence, p. 218.
87 See paragraphs 5.98 and 5.904. See also Transcript of Evidence, pp. 156 and 275.
88 Transcript of Evidence, p. 159.
89 See, for example, Transcript of Evidence, p. 154, pp. 195–6, 218–19, and p. 302.
90 Transcript of Evidence, p. 196.
91 See, for example, Transcript of Evidence, Mr Hindle, p. 290; Mr Burke, pp. 195–6, 218–19.
92 See, for example, Mr Winters report of Aug–Sept. 1971.
93 Transcript of Evidence, p. 1074.
94 Transcript of Evidence, pp. 195, 302–03.
95 Transcript of Evidence, Dr E. Francis, p. 1074. Cf. Mr Burke, p. 218.
96 Department of Health Report, Industrial Hygiene Branch, report of C.R. Simpson and A.T. Jones, 2 October 1970.
97 See, in particular, Report of 24 August 1969 by A.T. Jones.
98 Report of August–September 1971.
99 For example, on 18 February 1973, Dr McCullagh wrote: '. . . it is imperative that the operator, while emptying the hopper, wear either a half face respirator or a hood with its own supply of clean air'. Again, at least at the dust sock collector level, the problem of masks clogging was overcome with the introduction of an airline respirator with its own air supply.
100 Report of E. Francis and T. Jones, 24 April 1972.
101 Transcript of Evidence, p. 1771.
102 See Chapter 3.
103 Department of Mines Minutes from J.C. Collins, 16 May 1978, Minute of inspection of 20 July 1978 but cf. Minute of 18 January 1978 from J.C. Collins.
104 Transcript of Evidence, pp. 195–6.
105 Transcript of Evidence, 2 December 1973.
106 Transcript of Evidence, pp. 1078–9.
107 Transcript of Evidence, pp. 1082.
108 See Chapter 3.
109 Transcript of Evidence, pp. 1307–14.
110 Transcript of Evidence, p. 1308.
111 The Report of the Tariff Board Inquiry into Asbestos Fibre, dated 24th March 1955, contains evidence from J.T. Adamson, Managing Director of James Hardie and Co. Pty Ltd, showing that the Group's asbestos cement products manufactured in Australia were composed of a mixture of chrysotile (in large proportion) and amosite and/or crocidolite (in small proportion) and that the amphibole asbestos fibres were imported from South Africa because the cost was much less than that of Western Australian crocidolite.
112 See Transcript of Evidence, Mr Harrison and Mr Marshall, 6 February 1984; Mr Burke and Mr Hindle, 7 February 1984.
113 Transcript of Evidence, pp. 35–6. It is of course possible but not likely, that Mr Waghorn may have been exposed to crocidolite sometime prior to 1953 or during one of the breaks in his employment.
114 Transcript of Evidence, p. 900.
115 In so far as the state of knowledge of dust control and measurement in the asbestos industry permitted.
116 See further Chapter 4.
117 See Chapter 3.
118 See further paragraph 3.35.
119 See paragraph 4.3.
120 *Footner* v *Broken Hill Associates Smelters* 1983 Supreme Court of South Australia (unreported).
121 See further Appendix III, paragraph 1.64.

122 Professor Gandevia, Transcript of Evidence, p. 2263.
123 As to evidence from another jurisdiction, see *Grove* v. *Bestobell Industries Pty Ltd* (1980) Qd R. 12, per Dunn J. at 13.
124 Transcript of Evidence, p. 7.
125 Transcript of Evidence, p. 1761.
126 R. Gillespie — *The Victorian Asbestos Regulations — An Occupational Health Hazard* — Paper delivered at the Victorian Industrial Safety Convention, Monash University (August 1977).
127 *Royal Commission on Asbestos in Ontario* 1984, p. 818.
128 See Selikoff and Lee, *Environmental Research* 18, pp. 300–314, 1979.
129 *Ibid.*
130 See, in particular, British Occupational Hygiene Society, Committee on Hygiene Standards 'Hygiene Standards for Chrysotile Asbestos Dust' *Annals of Occupational Hygiene* 11 (1968) pp. 47–69.
131 Selikoff and Lee *Asbestos and Disease* p. 170.
132 *Royal Commission on Asbestos in Ontario* RCA Transcript, Evidence of Dr J.C. McDonald, 25 June 1981, Vol. 13, p. 139.
133 See paragraphs 5.21 to 5.22.
134 See paragraphs 5.149 to 5.153.
135 See Transcript of Evidence, p. 1761.
136 Part I, regs 1 and 3.
137 Mine manager's report, 19 August 1969.
138 Occupation and Health: Encyclopaedia of Hygiene Pathology and Social Welfare, ILO, 1930, (Vol. 1), p. 190.
139 Gillespie (1977).
140 See First Australian Pneumoconiosis Conference. University of Sydney, February 12 to 14 1968, *Proceedings*, p. 505.
141 See paragraph 5.38.
142 In 1968 the British Occupational Hygiene Society, *Annals of Occupational Hygiene* II, 47–69, made a similar conclusion, suggesting that the associated level of exposure was 2 fibres per cubic centimetre (f/cc), a tiny fraction of 5 million particles per cubic feet (mppcf).
143 Head Office memorandum dated 5 May 1965 by F.A. Page.
144 Proceedings of the First Australian Pneumoconiosis Conference, University of Sydney, 12–14 Feb. 1968.
145 *Ibid.*
146 Transcript of Evidence, p. 871.
147 See, in particular, Mine Manager's Reports for 1972, evidence (esp. 18.2.74, 3.3.72).
148 Inter-house letter from S.F. McCullagh to Mine Manager, Baryulgil, 12.1.1971, recorded a halving of dust levels, but Dr Francis later notes that the water spray 'was unsatisfactory and little used'.
149 Transcript of Evidence, p. 183.
150 Transcript of Evidence, p. 221.
151 Transcript of Evidence, p. 711.
152 Inter-house letter from S.F. McCullagh to Mine Manager, Baryulgil, 20.5.1971.
153 Report of visit to Asbestos Mine, Baryulgil, 28.2.66.
154 See report for April/May 1972.
155 Report of 12.2.73.
156 Letter from Dr E. Francis to Dr W. Crawford, 13.3.1976.
157 It may be noted that fabrene bags must have been on the market for some time, since Mr McCullagh's letter of 29.2.1972 states 'if cost is a factor consideration should be given to re-using Fabene bags in which we receive fibre from other suppliers.'
158 Mr Winters' report of 31 Jan.–1, 2 Feb. 1973.
159 Letters from S.F. McCullagh to Secretary, Asbestos Mines Pty Ltd, 21.1.74.
160 Report of Industrial Hygiene Survey of Baryulgil 30 Aug.–3 Sept. 1971.
161 Transcript of Evidence, Mr Burke, p. 182. See also inter-house letter from F.A. Page, Director of July 31, 1973, where he estimates the probable life of the mine as 2 years.
162 Transcript of Evidence, p. 187.

163 Transcript of Evidence, p. 182.
164 Report, Inspector of Mines Cue, 1954; Mines Department file 352/45.
165 George, W.E. (1947) Conference on Pneumoconiosis, Institute of Mining Engineers and Institute of Mining and Metallurgy, London.
166 *Op.cit* (55) pp. 189–195.
167 Transcript of Evidence, p. 588.
168 Smith, J.A. (1968) Dust control in quarries, In: Proceedings of the First Australian Pneumoconiosis Conference, University of Sydney, Feb. 12–14, 1968.
169 In-house Report, 28.2.66.
170 Transcript of Evidence, p. 182.
171 Transcript of Evidence, p. 2269.

Chapter 6

The role of the N.S.W. departments and instrumentalities

6.1 Three New South Wales Government agencies had responsibility at various times for inspecting and monitoring the Baryulgil operation. These were:

(a) The Mines Inspectorate. This agency is constituted pursuant to the *Mines Inspection Act* 1901. Currently it is part of the Division of Inspection Services of the Department of Industrial Relations (formerly the Department of Labour and Industry). Before that the Inspectorate was part of the Department of Mines.

(b) The Division of Occupational Health & Radiation Control (hereafter referred to as Division of Occupational Health). This body is now part of the Division of Inspection Services within the NSW Department of Industrial Relations. In the past it existed as the Division of Occupational Health & Pollution Control and prior to that simply as the Division of Occupational Health, within the Department of Health.

(c) The State Pollution Control Commission. This is a separate body, under the control of the Ministry of Planning and Environment, responsible for administering, inter alia, the *Clean Air Act* 1961 and the *Clean Waters Act* 1970. The State Pollution Control Commission only took an active interest in Baryulgil in 1977, not long before the mine ceased operations.[1]

6.2 The main monitoring and inspection activities at Baryulgil were undertaken by the Mines Inspectorate and by the DOH. The Mines Inspectorate has wide powers of inspection over 'mines' (which includes both the quarry and mill at Baryulgil) by virtue of the *Mines Inspection Act* 1901. These include the power to make 'such inspection, examination and inquiry as may be necessary to ascertain whether . . . this Act and the general rules and special rules are complied with' and the right to enter and inspect any mine 'at all times by day and night'.[2] However, although the Mines Inspectorate had responsibility for administering and enforcing occupational health and safety standards at Baryulgil, it lacked the technical expertise necessary to measure and assess the dust hazard to which workers were exposed.

6.3 In contrast, the DOH did not have any enforcement powers, but one of its functions was to monitor hazardous dusts, fumes and chemicals which were the subject of legislation administered by other departments. It was this role, of providing scientific and technical expertise in measuring hazards, that the DOH fulfilled in relation to Baryulgil. Accordingly, it often responded to requests for assistance from the Mines Inspectorate and occasionally from the Dust Diseases Board.[3] Most of the actual monitoring of dust or fibre levels was conducted by the DOH.

6.4 Thus we have the odd situation where one body has the statutory right to require compliance with regulations, but not the expertise to enforce them, while the other body has the expertise to police the regulations, but not the statutory right to enforce compliance.[4]

THE ADMINISTRATION OF SAFETY LEGISLATION

6.5 In June 1983, with a view to establishing how the Mines Inspectorate had utilised its powers under the *Mines Inspection Act* 1901 to ensure health and safety at Baryulgil, the Aboriginal Legal Service submitted a series of questions to the Chief Inspector of Mines.[5] Amongst the facts that emerged were as follows:

- that the Minister, pursuant to General Rule 65 of s.55[6] may direct that steps be taken to allay the dust produced during blasting, but that no such directions were ever issued.
- that an inspector may issue a requisition pursuant to General Rule 65A,[7] where dust in his opinion is likely to be injurious to health, requiring provision to be made for preventing or allaying such dust or the danger to persons liable to inhale such dust. There is no evidence of any such requisition being issued.
- that from 1965,[8] there was an obligation under General 65A, for all crushing and screening plants to be fitted with means, approved by the Chief Inspector of Mines, of suppressing, allaying or removing dust to the satisfaction of the Chief Inspector of Mines. There is no evidence that any dust suppression equipment was approved by the Chief Inspector pursuant to General Rule 65A.
- that the Chief Inspector of Mines had power, under General Rule 65C, for the purpose of evaluating safety standards, to require the medical examination of persons employed at the mine. There is no evidence that this power was ever used by the Chief Inspector in relation to Baryulgil, but the DOH did undertake medical examinations in the late 1970s.
- that, under General Rule 5, the manager of the mine was required to keep a book recording his inspections of safety appliances, gear and records of conditions, safety and repairs. Contrary to General Rule 5, no such book was kept, nor did the inspectorate (as they were entitled to) seek to peruse any such book.
- that where there is no express provision in the Act or Rules relating to a matter or practice which may threaten to cause injury, then under 2.37 the inspector *shall* notify the owner or manager of the mine specifying the nature of the hazard, the remedial measures required and the time for compliance. Non-compliance with a s.37 notice is an offence. No notice under s.37 was ever issued. However, whether such a notice *could* have been issued, even before 1964 (when an 'express provision' was made relating to asbestos[9]) is doubtful.[10]

The specific provisions setting down exposure limits for asbestos, made pursuant to General Rule 65B in 1964, 1973 and 1978, have already been described.[11] No prosecution was ever brought for breach of these provisions.

6.6 Given this backdrop of quite broad powers to regulate health and safety, how *did* the inspectorate use those powers at Baryulgil? More particularly, how effective was the inspectorate in ensuring the health and safety of the workforce?

6.7 The Mines Inspectorate records show that almost 90 visits were made by inspectors between 1953 and 1981. Most of these were routine visits by the District Inspector who did visual dust checks as well as general safety checks. The District Inspector was a generalist, with no particular concern with dust hazards. This is apparent from his reports, most of which record the operation as being in good working order and safe condition, but which contain very few specific references to dust levels. Only occasionally did the inspector ask that dust levels in a particular area be reduced, or draw attention to a particular dust problem. Yet as indicated in Chapter 5, there was undoubtedly a serious dust hazard at Baryulgil for many years. The District Inspector seems to have been oblivious of this, and to have taken little or no effective action to reduce that hazard.

6.8 Specialist dust testing was conducted mainly by the Division of Occupational Health, which, lacking any direct enforcement role, operated very much on an ad hoc basis. As Dr Francis, Scientific Officer of the Division of Occupational Health, described it:

> We used to get requests from factory inspectors, from the construction safety inspectors, the Dust Diseases Board and occasionally from management itself, or unions, and we just did them as they came along, virtually. We did not have any set program.[12]

The first tests conducted by the Division of Occupational Health at Baryulgil were in 1948 and 1952. No records are available,[13] but subsequent references to these reports, suggest that they recorded high dust levels.[14] It is therefore surprising that no effort was made to conduct further specialist inspections or to obtain further dust counts, until 1960. In the intervening years only the District Inspector of Mines visited Baryulgil, in the course of his routine inspections.

6.9 Why was no action taken between 1952 and 1960 despite the hazardous dust levels described by many witnesses and apparently recorded in the 1948 and 1952 reports? One explanation might be that the inspectorate was awaiting the construction of the new mill (an issue foreshadowed in a routine report in 1953) and saw little point in requiring short-term improvements in the old mill. If so, then they were knowingly condoning the exposure of the workforce to high dust levels for a number of years.

6.10 Another explanation might be that the government agencies at that time had little appreciation of the hazards to which the workers were being exposed. How aware *should* the Mines Inspectorate of the Division of Occupational Health have been of the dangers of asbestos? These agencies, like Hardies, should have had an interest in keeping abreast of occupational health hazards. In the case of asbestos, it should not have been particularly difficult to do so. Knowledge of the Merewether Report, of the 1931 British regulations, of the 1938 American Conference of Government Industrial Hygenists (ACGIH) standard, and in particular of the 1945 Victorian asbestos standard, should have been readily accessible.[15] It is true that in New South Wales there was no legal regulation relating to asbestos until 1964, but the ACGIH standard of 5mppcf seems to have been applied unofficially before that time.[16] In any event, by the 1950s, there was sufficient knowledge available for the government agencies to have realised that asbestos mining was a hazardous activity, and that large doses of asbestos dust could cause asbestosis. This was confirmed by Dr Francis of the Division of Occupational Health. She gave evidence that the Division of Occupational Health was aware of this hazard in the 1950s.[17] Although no specific evidence on this point was provided by the Chief Inspector of Mines, it would be surprising if information available to the Division of Occupational Health had not percolated through to the Mines Inspectorate. Indeed, the Division of Occupational Health should certainly have passed this information on as part of its functions.

6.11 One must conclude that either the inspectorate was aware that a health hazard existed but failed to take reasonable steps to protect the workforce or that if failed to keep itself reasonably informed of the hazards. In either event, the inspectorate failed adequately to discharge its responsibilities.

6.12 After a gap of eight years, the Chief Inspector of Mines requested a further dust count, and tests were conducted by the DOH in March 1960. Further tests were conducted in 1963, 1969, 1970, 1972 (twice) 1975, and by the Mines Inspectorate in 1969 and 1972 (in conjunction with the DOH), 1973, 1977 (twice) and 1978 (four times). The results of these surveys are examined in Chapter 5 and need not be repeated here. However, the way the Mines Inspectorate performed its regulatory role during that period, does require further examination.

Forewarnings of inspections

6.13 Evidence was given by a large number of witnesses that it was the usual practice for inspections to be forewarned.[18] For example, the fitter, Mr Hindle said:

> . . . in the 25 years that I had been there, I had never seen a mines inspector or health inspector or anything like that come in for a spot check. You would always get about a day or two days notice to slow down, clean up, get everything spick and span and in they would come when it was all beautiful.[19]

Similarly, the foreman, Mr Sheather stated:

> We were never given an unannounced visit by the inspectors. Word always came through two or three days beforehand that the Mines inspector will be here on Tuesday, Wednesday or whatever the appropriate day was and there was a general panic to clean up all sections of the mill up.[20]

Accounts such as these were repeated, with remarkable consistency and without exception, by both Aboriginal and non-Aboriginal workers.

6.14 The Chief Inspector Mines conceded the possibility that such prior warnings had taken place. He stated:

> It is not a general rule that we notify them. Each inspector in his district runs it as he sees it. There has never been any direct instruction that we do it one way or the other.[21]

6.15 Dr Francis gave evidence that the position was similar in the Division of Occupational Health in that each inspector made his or her own decision whether to notify management in advance of an inspection.[22] However, the Chief Inspector of Mines also stated that his own inquiries had not revealed any evidence to suggest that prior warnings had taken place in relation to Baryulgil.

6.16 The Committee is in no doubt that forewarnings of inspections did routinely take place over many years. The evidence in this respect is overwhelming. A more difficult question is how this forewarning came about.

6.17 The most innocent explanation put forward was that it occurred through operation of the bush telegraph. For example, the Chief Inspector of Mines stated:

> . . . in four out of the last five tests that were done, we went to Barraba first and then over to Baryulgil, so if there were leaks —which has been insinuated — it could have come that way.[23]

6.18 This is most unlikely to be the true explanation. There is evidence of such prior warnings long before the Barraba operation began, and other witnesses gave evidence of direct communications between the inspectors and mine management.

6.19 The mine manager, Mr Burke, said that he was responsible for providing lunch for any visitors, and that the inspectors would advise him in advance:

> someone else did not necessarily ring up and say 'they are coming' or anything like that. The parties concerned — they could be from the Mines Department or the Department of Public Health — usually rang up and let me know they were coming.[24]

Dr Francis of the DOH stated:

> There was no official policy that mines or anyone else were informed of the visit. However, it was in practice done. One of the reasons was, as a long travelling time was involved, to ensure that the mine was in fact working. It was a fact that the mine knew that the Division of Occupational Health would be dust testing in the mine on every occasion, in our submission.[25]

6.20 There is also evidence of more formal communications between the former Chief Inspector of Mines, Mr Burford, and Hardies Head Office. A letter from Mr Burford on 2 February 1973 included the statement:

> A survey of operations will be carried out by Department of Mines and Department of Health officers on 15th February, 1973.

A copy was sent to James Hardie Asbestos Ltd.

6.21 Finally, there is a memorandum of 20 July 1977, in which Mr Barwick of Woodsreef Mines Limited (hereafter referred to as Woodsreef) wrote that he had spoken to Mr Callose, the liaison officer, who had confirmed that check ups of Baryulgil employees would take place on 12 August and had also mentioned that the Department of Mines would be carrying out dust counts in the Baryulgil mill on 16 August. Mr Barwick gave

evidence that it was normal to be advised in advance of the inspectors visits, both at Barraba and Baryulgil.[26]

6.22 The majority of prior notifications of inspections were probably made direct to the mine management,[27] although some of the correspondence referred to above, suggests that on at least some occasions, communication was made directly with Hardies head office, and Mr Burke also suggested that this was the case.[28] However, there is no evidence to suggest any conspiracy between the inspectorate and head office, nor to suggest that head office sent any instructions to the mine to clean up prior to such inspections.

6.23 There is no doubt, that clean ups prior to inspections did take place routinely at the instigation of the mine manager. The evidence suggests that very vigorous efforts were put into such clean-ups and often the men worked overtime through the weekend to achieve satisfactory results.[29] Indeed, on at least one occasion, evidence of a clean-up was obvious to the inspectors since the mill floor was still wet and had presumably been hosed down to suppress dust.[30]

6.24 Whether such clean-ups were deliberate attempts to disguise the hazards, or were more in the nature of good housekeeping[31] (in much the same way as one might tidy the house for visitors) in unclear. The result, whether intended or not, was to reduce dust levels in the general mill area and to create a favourable impression. Consequently, inspectors rarely saw working conditions as they really were, and dust levels were presumably lower than at other times.

6.25 Three witnesses also gave evidence that the mill was slowed down immediately before the inspector's visits, in order to minimise the amount of dust emitted. According to the fitter, Mr Hindle, this practice:

> started actually from the inception, from when I first went there. It just became a habit and it went right through. The moment they said there was an inspector coming, I do not think anyone had to tell anyone. It was just a matter, when we knew they were coming through, of a quick clean up and slow down. It was an automatic thing.[32]

This was confirmed by the foreman between 1969 and 1972, Mr Sheather,[33] and by Mr Walker, who stated that:

> while [the inspector] was there they used to cut the feedback in the mill when they were processing the asbestos in the quarry. They cut it back so it would go through the quarry and the shaker screen very slowly so there was not much dust created at the time the inspector was there. As soon as he went through the gate the manager would instruct the engineer or anyone up there at the time to go and turn the feedback up to full production, which would create this dust in the mill again. But while the inspector was there there was a very small amount of dust floating around the mill.[34]

6.26 The evidence of Mr Burke was inconsistent. Initially he gave evidence that the operators had slowed down the mill, though not at his direction.[35] Later, he denied that this had occurred.[36] His evidence on this point must be regarded as unreliable.

6.27 There is also the cryptic comment of Dr Francis, that the dust level measured at the primary crusher in 1975 'can only be accounted for by a reduction in the workload'.[37] In evidence she stated:

> if the rock is all wet, if for some reason the mill is working slowly or if there is not as much rock going through it, your reading will not be typical. It will be a fraction of what it might be on a dry day when the plant is going flat out. That will happen in a brickworks or anywhere, and will happen either in the normal work procedures or deliberately.[38]

However, she was unable to say whether there had in fact been any deliberate slowdown either then or during any other inspection.

6.28 The balance of evidence suggests that such deliberate slowdowns did occur. This too, would have contributed to the inspectors obtaining artificially low dust readings.

Again, it must be emphasised that there is no evidence that Hardies knew condoned or encouraged any such practice.

The infrequency of inspections

6.29 Even after 1960, the mine monitoring authorities failed to conduct regular and frequent visits to the mine in order to measure dust levels. From 1960–1976, dust measurements were made, on average, only every two years. This can hardly be considered adequate when, even on the Division of Occupational Health's own figures, dust levels in some areas clearly exceeded the then recommended levels. Yet only in the final two years of the mine's operation, was adequate monitoring maintained.

6.30 The failure to monitor more frequently is particularly surprising after 1965, the year in which the proceedings of the New York Academy of Science's International Conference on the Biological Effects of Asbestos were published.[39] Data presented at the conference suggested that quite low doses of asbestos could cause disease. That conclusion aroused widespread publicity and awakened concern in a number of government authorities. The N.S.W. Department of Public Health for example, began organising an investigation for the detection of lung cancer in workers associated with asbestos, and similar programs were anticipated elsewhere.[40]

6.31 The Conference put the Division of Occupational Health and the Mines Inspectorate on notice that much lower levels of asbestos than had previously been realised, could cause disease. However, this apparently did not arouse any particular concern as to the health hazard at Baryulgil, for no further recommendations for dust control were made, nor dust monitoring undertaken until 1969.

THE RESPONSE TO THE HAZARDS

6.32 Over the period 1970–1976. Hardies conducted an industrial hygiene program and took their own dust counts at Baryulgil. As indicated earlier, the results obtained by the regulatory agencies presented a far more optimistic picture of conditions at Baryulgil, than did Hardies own surveys. No doubt the failure to undertake 'surprise' inspections, the practice of prior notifications and resultant clean-ups contributed to the unrealistic results that were obtained.

6.33 Either the government agencies failed to realise that the mine and mill were being cleaned up before an inspection, or they did know but did not care. Probably the inspectorate was oblivious of the true situation. However, Dr Francis gave evidence that on at least one occasion it was apparent that a clean-up had taken place, but neither she, nor the other departmental officers, seem to have been troubled by this. Apparently it never occurred to regulatory agencies to make a surprise visit to see whether this would reveal markedly different dust levels to those normally recorded.

6.34 Even judged at face value some of the surveys conducted by the Division of Occupational Health *did* reveal dust levels clearly in excess of the then recommended levels. For example, the 1960 survey, which showed generally satisfactory results, nevertheless recorded one count of 20 million parts of dust per cubic foot — four times the then recommended limit. The dust counts of 24 August 1969, 15 September 1970, and 16 August 1972 all showed *some* readings (albeit a minority) in excess of the then recommended limits, and the survey of 1 March 1972 showed that approximately 90% of sites measured did not comply with recommended standards and that at the dust house this standard was exceeded by a factor of 70.

6.35 How adequate was the inspectorate's response to these dust readings? Although some of them were clearly unsatisfactory (particularly in the light of the 1964 New York Conference) little effort was made to ensure that improvements were carried out. The

only action which was usually taken was to send a copy of the report to the Mine Manager and to Hardies head office. These reports often contained recommendations for dust control arising out of the inspection, but there was generally little or no follow up by the inspectorate. If their recommendations (or those of the Division of Occupational Health) were not carried out, or if the operating company did not succeed in reducing dust levels, this would not become apparent to the inspectorate until they (or the Division of Occupational Health) took their next dust count, perhaps two years later.

6.36 Even then, their approach was hardly systematic or rigorous. For example, the site identified as having an excessive dust count in 1960, was not even re-measured in the survey of 1963, nor indeed were most of the sites measured in the previous survey. Again, in the survey of October 1973 the inspector, while noting the short staffing of the plant, the 6 inches of rain the previous day and consequent natural 'wetting down' of the fibre, and the lack of wind, did not seem to consider that the combination of these factors could clearly create a dust situation totally unrepresentative of normal conditions at the mine. Significantly, Hardies own figures for October 1983 show much higher dust levels, with readings as high as 62.8, 13.9, 8.2 and 7.0 f/cc for various processes.[41]

6.37 The Chief Inspector of Mines maintained that the existing policy (of making recommendations without invoking the powers under the *Mines Inspection Act* 1901) was the most appropriate response and had ensured a gradual improvement in working conditions. He implied that it would have been counter-productive to take any stronger action against the operating company.[42]

6.38 It is doubtful whether this is correct. The inspectorate certainly cannot claim to have had any great success with this approach in the early years. As Dr Francis pointed out, the early reports 'indicate that extremely high dust generating procedures were in use for many years. It is obvious that the use of dust control measures and respiratory protection were extremely limited.'[43] Some of the later year inspections were apparently no more successful in achieving improvements. The 1969 inspection report made a number of recommendations in order 'to maintain dust exposures at as low a level as possible'. However, when Hardies conducted their first internal dust count just over a year later, it revealed 'alarming high dust levels' at some locations and an overall dust level in the mill of 19f/cc. No measures had apparently been taken by the inspectorate in the meantime to ensure that the recommendations of the 1969 report were implemented.

6.39 The Mines Inspectorate were not invariably unsuccessful in achieving improvements. A striking example to the contrary is the 1972 surveys. A DOH dust count in March 1972 had revealed high levels of asbestos fibres at a variety of locations and all tests, except in the atmosphere outside, showed results in excess of 4f/cc. Exceptionally, a further visit was arranged for 16–17 August apparently because of:

> claims that certain dust counts previously taken by the Division were excessive and that the modifications which had been suggested on the basis of these counts were of such an expensive nature that might require the closure of the mine.[44]

Dust counts on this second visit were found to be much lower (discounting the possible effect of clean-ups), and it was noted that several improvements had been made to the plant.

6.40 Taken overall, however, the inspectorate's policy cannot be judged a success. As Hardies own figures show, many stations still recorded dust levels in excess of the recommended levels, even in the mid 1970s. As late as 13 December 1977, the Assistant Under-Secretary of the Mines Department, Mr Rose, acknowledged in a Minute Paper that:

> it is apparent that there is a problem of lung disease in the Aboriginal population at Baryulgil . . . The Department has consistently pursued the four particles rule as far as

asbestos is concerned in mining operation, *but we cannot claim to have been particularly successful in forcing company observance of this standard.* (emphasis added)

6.41 It was only in the last two years of the mine's operation that dust levels came under close scrutiny from the inspectorate, and only in 1978 that the legal standard was clearly complied with throughout the mine and mill.

6.42 No doubt the inspectorate played a constructive role in providing encouragement and advice to management and in making recommendations for dust control measures. Sometimes, no further action was necessary and management would willingly implement the inspectorate's recommendations. However, the Committee is concerned that the inspectorate invariably operated in this manner and saw no role for further and more vigorous enforcement action. In particular, the inspectorate chose not to invoke its powers to issue notices or directions under General Rule 65 or 65A to ensure the prevention or reduction of dust during particular processes. Nor did it ever contemplate prosecution as a means of ensuring that the employer complied with its obligations under the Act.

6.43 We are not convinced that the inspectorate was sufficiently decisive either in conveying to management the sense of urgency that was appropriate in achieving improvements or in pursuing the question of prosecution when, over a period of years, improvements were not forthcoming. There were undoubtedly occasions during the inspectorate's administration of the Baryulgil operation, when its statutory powers could have usefully been involved to ensure that a recalcitrant management complied with its obligations. Even before any specific asbestos standard was imposed in 1964, the general powers under GR65A could have been used to ensure that dust levels were reduced to safer levels.[45]

6.44 An illustration of the inspectorate's reluctance to use its statutory powers or to take effective action relates to the maintenance and use of respirators. Dr Francis gave evidence that respirators were not adequately cared for and that 'there was no respirator program at the Mine'. This was corroborated by a number of other witnesses, who also gave evidence that respirators, when available, were generally not worn.[46] An example of this was noted in the inspectorate's own report of April 1972.

6.45 Despite knowledge both of excessive dust levels and of a reluctance to wear respirators, no action was taken for many years to ensure that the company instituted a proper respirator program. Only in 1978, following adverse publicity, were directions finally issued by the Chief Inspector of Mines which required that approved respirators be worn by every person in the mill both employees and staff until an amended dust limit of 2 fibres/ml be met.

6.46 One further deficiency in the Mines Inspectorate's approach deserves mention. This was the inspectorate's failure to inform the workers adequately about the dangers of asbestos exposure or of the need for safe handling. The Chief Inspector of Mines apparently took the view that this was a management responsibility and that the inspectorate had little or no contribution to make. The consequence of this approach was unfortunate. Had the Inspectorate been more willing to explain the hazards to the workforce they might have had more co-operation in ensuring that masks were worn and safeguards observed. They might also have learned more of the process of slow-downs and clean-ups which preceded their inspections.

6.47 The criticisms made in this section do not apply with the same force to the Division of Occupational Health. Its function was the scientific one of conducting tests and dust monitoring. It had no enforcement powers or responsibilities, and discharged its obligations by passing on the results of its surveys to the Mines Inspectorate. When it became aware of the extent of the hazard at Baryulgil, and of the extent to which respirators were not used, it is arguable that it should have made more vigorous

representations either to the Mines Inspectorate or to the higher echelons of its own Department. However, beyond this, it is difficult to see what action it could reasonably have taken.

THE ROLE PLAYED BY STATE AUTHORITIES CHARGED WITH REGULATING POLLUTION

6.48 Responsibility for control over any air or water pollution emanating from the site of the Baryulgil mine and mill lay initially with the Department of Public Health, by virtue of the *Clean Air Act* 1961 and the *Clean Waters Act* 1970. In 1970, the State Pollution Control Committee was created, and given control over the matters covered by the *Clean Air Act* and the *Clean Waters Act*.[47] Overall departmental responsibility for these Acts rests with the Department of Planning and Environment.

Air pollution

6.49 Part III of the *Clean Air Act* makes provision for the licensing of Schedule Premises and gives the Department (and, after 1970, the State Pollution Control Commission) certain powers to control air pollution emitted from Schedule Premises. Part IV of the Act gives powers to control air pollution emitted from premises other than Scheduled Premises. By Section 5(1) Scheduled Premises means 'any premises for the time being included in the Schedule to this Act'.

6.50 The Baryulgil mine and mill came within the Schedule following an amendment on 11 January 1963[48] which extended the Schedule to include premises devoted to 'Grinding, milling or size separating of minerals, chemicals or grains.'[49]

6.51 Thus, prior to 11 January 1963, the powers of control of the Baryulgil mine and mill were those contained in Part IV of the Act relating to premises other than Scheduled Premises. In the case of such premises, control was basically vested in the local authority, which in this case was the Copmanhurst Shire Council.

6.52 By Section 19, as passed in 1961, occupiers of premises were prohibited from conducting their operations so as to allow the emission of air impurities above the amounts specifically set in the Regulations made pursuant to the Act; if no standard was specifically set, occupiers were required to conduct their operations so as to prevent or minimise air pollution. This section was amended in 1974,[50] but by that time it had ceased to apply to Asbestos Mines Pty Ltd, which came within the Schedule in 1963. No standards specified in the Regulations were appropriate to the type of operation carried out at Baryulgil[51] and therefore Asbestos Mines Pty Ltd would have been bound by the alternative requirement to prevent or minimise air pollution by whatever means were practicable.

6.53 Section 20 gave the local authority power to require remedial measures to be carried out by the occupier where air impurities were being emitted or were likely to be emitted from permises other than Scheduled Premises. This section was also amended in 1974,[52] after it had ceased to apply to Asbestos Mines Pty Ltd.

6.54 There is no evidence that any notices requiring any action to eliminate or minimise air pollution from the Baryulgil plant were served on the company by the Copmanhurst Shire Council between 1961 and 11 January 1963. Evidence given to the Inquiry in submissions and at Hearings suggests that air pollution of the surrounding neighbourhood, and particularly of Baryulgil Square, did take place.[53] Most of this evidence is not specific as to date, and it may therefore not relate to the period when Sections 19 and 20 were applicable to the operation. However, the evidence of former mine manager, Gerry Burke, suggests that the level of pollution did not change between 1959 and 1979[54].

Referring to photographs of the mine and mill, he said:

> Those photos line up exactly with the photos that were taken by the 'Northern Star' newspaper in early 1959. The 'Northern Star' came over and did a coverage of the mine as it was a new plant opened up. It did a publicity cover for it and in the publicity cover — this was a brand new plant — the dust was literally pouring out of that plant. The photos were taken from about 300 yards away from it, looking back on to it. In my briefcase I have got photos taken just prior to the shutdown of the plant and there is no difference in the photos; they are the same thing. So even a brand new plant, brand new in 1958 with no problems at all and all the equipment new, was throwing out just as much dust then as it was when it finally shut down.

6.55 Mr Kelso, representing Hardie Trading, was at pains to argue that the dust emanating from the mine was not harmful, being serpentive dust from the crushed host rock rather than asbestos fibre.[55] However, even if this were true, the dust would still have qualified as air pollution within the meaning of the Act. Section 5(1) defines 'air pollution' as meaning 'the emission into the air of any air impurity'. 'Air impurity' is defined in the same section as including:

> smoke, dust (including fly ash), cinders, solid particles of any kind, gases, fumes, mists, odours and radioactive substances.

6.56 Thus, it seems clear that, although substantial air pollution was taking place between 1961 and 11 January 1963, the Copmanhurst Shire Council took no steps to exercise its powers under Section 20 of the *Clean Air Act* to require Asbestos Mines Pty Ltd to prevent or minimise that pollution. Nor, it would seem, did the Under Secretary of the Department exercise the power under Section 20(3) to require such steps to be taken when the local authority has failed to act.

6.57 With the amendment to the Schedule on 11 January 1963, the Baryulgil mine and mill became Schedule Premises, and the relevant powers of control were those in Part III of the *Clean Air Act*. However, the licensing provisions in Division 1 of Part III did not apply to Baryulgil until 1 August 1976. It was only as of that date that Division 1 applied to the Companhurst Shire by proclamation of 23 June 1976.[56] division 2 of Part III, which gave the Department (and after 1970 the State Pollution Control Commission) powers of control over air pollution emitted from Schedule Premises did, nevertheless, apply to the Baryulgil operation from the moment that it came within the Schedule.

6.58 Sections 14 and 15 imposed certain obligations on the occupier of Scheduled Premises. As at 11 January 1963, those obligations were to maintain and operate air pollution control equipment efficiently, to observe any standards of emission specifically set in the Regulations, or, if no such standards were set, to conduct operations so as to prevent or minimise air pollution.[57] Since no prescribed standards of concentration covered the Baryulgil operation, Asbestos Mines Pty Ltd were required to operate so as to prevent or minimise air pollution by whatever means practicable.

6.59 The powers to control breaches of Sections 14 and 15 were contained in Section 17. It provided that the Under-Secretary could, by notice, require the occupier to instal control equipment and to operate that equipment so as to prevent or minimise air pollution.[58]

6.60 There has been no evidence given to the Committee that any action was taken by the Under-Secretary or the State Pollution Control Commission to exercise the powers in Section 17 by requiring Asbestos Mines Pty Ltd to take any of the steps set out in that section to control air pollution, although it would appear from the evidence that substantial pollution was taking place. Not only Mr Burke's evidence (quoted in paragraph 6.54) suggests this. So also, in relation to the period between 11 January 1963 and 24 April 1979[59] during which the Baryulgil operation came within the Schedule, does the evidence of Dr McCullagh, Hardies medical officer.[60]

6.61 As well as the specific powers for control of Scheduled Premises in Part III of the *Clean Air Act* 1961, and for control of premises other than Scheduled Premises in Part IV, there are a number of powers in Part V which relate to control of all premises, whether Scheduled or not. Section 25 of the Act provided (in 1961) that the Minister might, by order, direct an occupier to cease operations which resulted in air pollution. That section was amended in 1974[61] to allow the Minister to direct a cessation of operations resulting in the emission of air impurities which:

> is or is likely to be injurious to public health, or is causing or is likely to cause such discomfort or inconvenience to any persons not associated with the management or operation of any trade, industry or process in or on such premises as warrants the making of an order . . .

The penalty for failure by an occupier to comply with such order was $10,000, and in addition $5,000 for each day the offence continued.

6.62 Section 25A, inserted by the amending Act in 1974[62] provided that the State Pollution Control Commission might direct the relevant local authority, where an enterprise was causing air pollution, to take whatever action was necessary to disperse and mitigate that pollution.

6.63 Section 27 empowered an authorised officer to enter any premises and inspect in relation to air pollution.

6.64 There is no evidence of any action being taken at any time in relation to Asbestos Mines Pty Ltd under Sections 25 or 25A. There is no clear evidence of any inspection of the premises of Baryulgil before 1977.[63] On 1 August 1976, the provisions of Part III, Division 1 of the *Clean Air Act* 1961 were extended to cover premises within the Copmanhurst Shire. From that date, Asbestos Mines Pty Ltd was required by Sections 10 and 11 to hold a licence in respect of their premises. By Section 11(3), licences remained in force for one year, and were to be renewed annually.

6.65 The evidence as to the date on which Asbestos Mines Pty Ltd became licensed is confusing. Submissions to the Inquiry present the State Pollution Control Commission as stating that a licence was issued on 28 April 1977[64] and Woodsreef as stating that a licence was first applied for on 23 November 1977.[65] Thus, Asbestos Mines Pty Ltd were in breach of Sections 10 and 11 either from 1 August 1976 to 28 April 1977 or from 1 August 1976 to 23 November 1977.

6.66 The State Pollution Control Commission also stated that 'The mine closed, we believe, on 24 April 1978, and thus renewal of the licence was not sought.'[66] The Woodsreef submission makes no reference to any renewal of the licence (apparently) applied for on 23 November 1977. In fact, the mine closed on 24 April 1979.[67] Thus, since licences were valid for one year only, if the licence was issued on 28 April 1977, Asbestos Mines Pty Ltd was in breach again from 28 Aril 1978 to 24 April 1979. If the licence was issued sometime after the application of 23 November 1977, the second period of breach of the licensing provisions extended from December 1978 to 24 April 1979.

6.67 There is no evidence of any action taken by the State Pollution Control Commission after 24 April 1978 to ensure that the company carried out its obligation to renew its licence. It would appear also from the evidence that the action taken by the State Pollution Control Commission to ensure that Asbestos Mines Pty Ltd took out a licence once that became required on 1 August 1976 was not very vigorous. The former mine manager stated that at the time of the application in 1977, no inspection of the Baryulgil premises was made.[68] That statement emerges from the following passage of transcript:

CHAIRMAN — Following Andy Donnelly's death in 1977, the State Pollution Control Commission contacted you concerning the issue of a licence for the mine. Is that correct?

Mr Burke — That is correct.

CHAIRMAN — Was it granted?

Mr Burke — There was a meeting arranged 30 miles away in a town, over lunch. The licence was paid for, written out and obtained at that particular point and that was the only contact with them up until exactly one week after the closure of the mine.

CHAIRMAN — Did they every look at the levels? Did you take them over the files? Did they visit the venue?

Mr Burke — They came prior to that period. The local chap — I think he is from Glen Innes — came prior to that time on the basis of having a licence, because I understood that they realised that we should have had a licence which they applied over us. With that in mind he came and had a look. A couple of years went by between these particular times.

CHAIRMAN — From his visit to the granting of the licence?

Mr Burke — To the granting of a licence.

CHAIRMAN — So it was really Donnelly's death that brought about some haste by the Commission?

Mr Burke — Yes, of course.

Burke's evidence receives some support from the State Pollution Control Commission's statements. The State Pollution Control Commission itself acknowledged that 'No tests were carred out at the point of discharge.'[69]

6.68 However, the submission by Woodsreef Mines Ltd is to a different effect. That submission stated:

> Mr Burke stated that Mr Callose organised to meet the SPCC Officers in Tabulum, 30 miles from Baryulgil. The Public Interest Advocacy Centre questioned that the license was issued under the Clean Air Act without testing the emissions or without a visit or inspection of the premises. Whilst posed as a question it could be left in the committees minds as a fact. In a letter dated 16th November, 1977 when the license was issued, a letter written by the State Pollution Control Commission, a copy of which is attached, the first paragraph quotes 'on the 3rd November, 1977 officers of the Commission inspected the premises known as Asbestos Mines Pty Ltd, Baryulgil, New South Wales following receipt of a complaint' unquote, this letter was signed by Mr Dickenson, Secretary of the Department.[70]

Mr Barwick, Chairman and Managing Director of Woodsreef Mines Ltd, gave evidence to the Committee on 28 June 1984. He was questioned about that passage in the Woodsreef submission:

Mr ANDREW — To take up a separate issue, in your letter of 9 May this year, you took issue with the PIAC submissions for an alleged suggestion that the licence under the *Clean Air Act* was issued to Asbestos Mines without prior visit or inspection by the SPCC. You referred to a letter from the State Pollution Control Commission, which mentioned a visit on 3 November 1977, following a complaint several weeks before the application for the licence on 23 November. What was the nature of the complaint which led to the visit of the State Pollution Control Commission officers to Asbestos Mines on 3 November 1977?

Mr Barwick — I do not know what the complaint was; I only have the letter which said it was as a result of a complaint. I understand that it was just that the operation was operating without the appropriate licence. And yes, I did feel that Mr Burke's memory about modifications and improvements to the mill was very vague, but yet he could remember that that visit did not take place, when, in fact, it did. So I was actually concerned that he had a memory lapse every now and again.

Mr ANDREW — That visit by the Commission was not explicitly because of a complaint about emission levels or anything?

Mr Barwick — No. I believe — and as I say, I only have the letters — it was because we were, in fact, operating without the appropriate licence.

Mr ANDREW — Could you then comment on whether or not the Commission in fact tested emission levels, prior to consideration of whether or not it would grant you a licence?

Mr Barwick — I would have to refer back to the letter. I thought that it did say in the letter that it did do some tests.

Mr BLANCHARD — Is this the letter dated 22 November?

Mr Barwick — Yes.

Mr BLANCHARD — It says in the first paragraph that on 3 November, 1977 officers of the Commission inspected the premises at Baryulgil, following the receipt of a complaint. Who made the complaint, do you know?

Mr Barwick — No, I do not, but reading the letter, I feel that the complaint was that we were acting without the appropriate licence — that is the complaint to which it was referring. I may have assumed that it had carried out tests, because otherwise the licence would not have been granted. My comment on that particular letter is that I believe, from reading 'Hansard', that Mr Burke made the comment that the licence was issued by Mr Callose going to Casino or somewhere else, and that they, in fact, did not visit the site. I just wanted to make it very clear to the Committee that that was not the truth.[71]

6.69 There may be a way in which both accounts can to some extent be rationalised. Mr Burke had stated that there was a gap of a couple of years between the State Pollution Control Commission's visit and the granting of the licence, but that the visit had related to the company's obligation to hold a licence.[72] Yet that obligation only arose on 1 August 1976,[73] which is not 'a couple of years' before the licence was granted. It may be that the visit Mr Burke remembered was about some other matter within the State Pollution Control Commission's jurisdiction. If it had occurred a couple of years before 1977, it would have been before Woodsreef Mines Ltd purchased Asbestos Mines Pty Ltd,[74] and therefore Mr Barwick would not have been aware of it. The State Pollution Control Commission's letter of 16 November 1977[75] clearly refers to an inspection on 3 November 1977. It would seem then that Mr Barwick was right in his suggestion[76] of a memory lapse by Mr Burke and that looking back at the events of the mid 1970s from 1984, Mr Burke had forgotten the second visit, and confused the date and purpose of the first, thus elliding the two. If this supposition is right and the visit to which Mr Burke referred was before the licence provisions applied to the Baryulgil mine, one is left with the fact that the State Pollution control Commission did not visit the mine or attempt to enforce the licence provisions for 15 months after the obligation to hold a licence bound the mine. Thus on any view, enforcement of that portion of the Action in relation to Baryulgil was lax.

6.70 The State Pollution Control Commission was also involved in investigations concerning the residue of tailings in the grounds of the Baryulgil school. Here, their activity seems to have been more vigorous. It appears that between November 1977 and March 1980, the State Pollution Control Commission made several inspections of the school area and communicated concern about possible health hazards to the Department of Education and the Department of Public Works. However, by March 1980, the State Pollution Control Commission was apparently satisfied that the measures taken had eliminated any future risk.[77] There is no record, in the evidence before the Committee of any further State Pollution Control Commission involvement in relation to the Baryulgil Public School after March 1980. In this regard, it is appropriate to recall the comment, in October 1980, of the geologist engaged to report on the situation by the Department of Aboriginal Affairs. Writing of the State Pollution Control Commission's expression of satisfaction in April 1980 that tailings at the School were no longer likely to cause problems, the geolgist said 'It is already evident that such precautions were inadequate.'[78]

Water pollution

6.71 It was not until 1970, with the passage of the *Clean Waters Act*, that the law covered any water pollution emanating from the Baryulgil mine and mill. Like the *Clean Air Act* 1961, the *Clean Waters Act* lies within the jurisdiction of the State Pollution Control Commission. Section 16 of the Act prohibits the pollution or the causing or permitting the pollution of any waters by any person, except according to the conditions of a licence issued under the Act.[79] By Section 16(7), it is an offence against the Act either for an unlicensed person to pollute any waters or for a licensed person to pollute waters otherwise than in accordance with the conditions of the licence.

6.72 Evidence given to the Committee suggests that pollution of waters took place, and is still taking place, as a result of asbestos fibres being carried by way of rain and its run-off from the tailings dump on the property of Asbestos Mines Pty Ltd into the waters serving Baryulgil Square.[80]

6.73 No evidence has been received of any monitoring of water pollution at Baryulgil before March 1980. In fact, the State Pollution Control Commission reported on 1 May 1979 that:

> No tests have been carried out by the Commission on water from either of the creeks or the river to check for the presence or otherwise of asbestos.[81]

6.74 Nor has the Committee received any evidence to show whether or not Asbestos Mines Pty Ltd held or continue to hold a licence under the *Clean Waters Act* 1970.

6.75 It would appear that, until 1980, the State Pollution Control Commission made little attempts to exercise its powers under the *Clean Waters Act* 1970 in relation to Baryulgil, and that, since 1980, it has done little to monitor the state of the waters around the mine site to ensure that the favourable situation which it then found (attributable to the drought)[82] has continued.

6.76 In summary, an examination of the Baryulgil situation since 1961 discloses an almost complete failure by the State Pollution Control Commission to carry out its statutory duties and to exercise its statutory powers, despite clear evidence that pollution was occurring throughout the period.

THE ROLE PLAYED BY THE WORKERS' COMPENSATION (DUST DISEASES) BOARD

6.77 The Workers' Compensation (Dust Diseases) Board[83] was created by the *Workers' Compensation (Dust Diseases) Act* 1942 (formerly the Workers' Compensation (Silicosis) Act). The 1967 amending Act[84] extended the scheme, which had previously related to compensation for silicosis only, to cover a range of dust diseases, including asbestosis. Mesothelioma and bronchogenic carcinoma were included as dust diseases under the Act by the *Workers' Compensation (Dust Diseases) Amendment Act* of 1983.[85]

6.78 The Dust Diseases Board is primarily a compensatory body[86] and has no official duties of inspection or regulation. Where the Board becomes aware of a dust hazard existing in a particular workplace, as a result of an application for compensation by a person employed at that workplace, the Board refers the matter to the Division of Occupational Health for investigation. The action taken by the Board in respect of the Baryulgil mine and mill is described in the Board's submission[87] as follows:

> The Dust Diseases Board first became aware of the Baryulgil mine in November, 1968 when it received an application for compensation from an ex-worker of the mine. This worker was found to be suffering and partially disabled by asbestosis.

Following an inspection of the mine by a Board member, who was accompanied by the Board's Specialist Medical Officer and a Senior Inspector, it was considered that a possible dust hazard existed in the mining operation and throughout the ore treatment plant. The Board then requested the Division of Occupational Health to inspect the operation and carry out dust count counts to see if workers were being exposed to excessive volumes of hazardous dust.

A report from the Division disclosed that from an asbestos dust point of view working conditions were unsatsifactory as dust counts showed in practically every instance results in excess of the recommended exposure to asbestos of 4 fibres per millilitre. Copies of this report went to the Manager of the Company, to the Company's medical surveillance officer, and to the Chief Inspector, Mines Inspection Branch. The Division of Occupational Health took the matter up with the company and the Board specifically referred the matter to the Mines Inspection Branch for appropriate action to correct the problem. At the same time the Board advised the Mines Inspection Branch of the disability suffered by the ex-worker at the mine.

A subsequent inspection by the Division of Occupational Health conducted in August, 1972, at the Board's request showed working conditions were markedly improved with all fibre levels reduced since the previous inspection. Copies of this report again went to all interested parties.

In August, 1975 a further inspection was carried out by the Division of Occupational Health which showed that all dust concentrations were below the recommended standard of 4 fibres per ml. of air. In general the report stated that conditions were satisfactory and dust levels were lower than found on the previous inspection.

The Board continued to monitor the situation by receiving copies of reports of inspections carried out from time to time by the Mines Inspection Branch until the closure of the mine in April, 1979.

No doubt the Mines Inspection Branch and the Division of Occupational Health will report on their actions in more detail but in so far as the Board is concerned appropriate action was taken from the time it became aware a problem existed. From these reports it would be reasonable to say that prior to 1972 workers were being exposed to excessive dust but after this date conditions improved considerably. It should be remembered, however, that the recommended standard has been reduced from 4 fibres per ml. of air which existed in 1972 to the present N.H. & M.R.C. recommended standard of 1 fibre per m. of air. . . .

The Board is a workers' compensation body and its function is limited to the granting of compensation to workers or ex-workers or deceased workers' dependants who have been found to be disabled by those dust diseases listed in the schedule or covered by the definition of dust disease included in the Act. Other injuries or disabilities caused by employment at the mine would be covered in the normal manner by the Principal Act, the Worker's Compensation Act.

The Board is in constant liaison with the Division of Occupational Health and where in the carrying out of the surveys the Division considers a worker or ex-worker may have a dust disease then such a person is invited to make an application to the Board.

Over the years the Board has carried out medical examinations on a number of workers from the Baryulgil mine, but with the exception of the one previously mentioned none has been found to be disabled by a dust disease within the meaning of the Act.

6.79 Representatives of the Dust Diseases Board gave evidence to the Committee at a Public Hearing on 10 February 1984. The question of the board' actions in relation to Baryulgil was raised:[88]

CHAIRMAN — There was a case for compensation in 1968 by a former Baryulgil worker found to be partially disabled by asbestos. What would have been the procedure after that case was heard by the Dust Diseases Board? Would it have requested the Department to carry out tests, suggesting to it, as it mainly acted on request, to carry out further tests and ensure that regulations were followed by the body?

Mr Virgona — The situation was that it was not until 29 February 1968 that asbestosis became a scheduled disease. Prior to that we were just the Silicosis Committee of New South Wales. I think Cyril Mundine was the first and only person that the Dust Diseases Medical Authority found to be disabled as a result of exposure to asbestos at Baryulgil. He was compensated and on his death his wife was also compensated as a dependant. The Board's financial situation is governed by premiums charged on the whole of the population of New South Wales but mainly on what we call determined classes of employment which the Board considers give rise to these disabilities and they are charged at a higher premium. As a result of that compensation claim our only inspector at the time went up to Baryulgil, it might have been a year or two after that. He went there to inspect for the purposes of financial arrangements and he indicated that a hazard existed. Flowing from that, the Board's medical officer, a member of the Board and the Board' inspector went up to Baryulgil ———

CHAIRMAN — When was that?

Mr Virgona — I think they went up there in 1970 or 1971. As a result of that we wrote to the Division of Occupational Health asking them to go to Baryulgil to conduct dust counts to see if the conditions were hazardous. You have heard reports of what went on from Dr Francis, who by the way is paid by the Dust Diseases Board through the Health Commission. We subsidise two scientific officers at the Health Commission to assist in dust situations.

During the Hearing, Mr Virgona emphasised that:

> We are primarily a compensatory body. When we find that something is wrong such as when we get a person who is diabled by a dust disease we make sure that the proper authorities in the occupational health field are made aware of it.[89]

Mr Virgona's remarks show that any inadequacy in the monitoring and regulation of dust levels and health hazards at the Baryulgil mine and mill was the fault of the Mines Inspectorate and not of the Dust Diseases Board.

LESSONS FOR THE FUTURE

The enactment of safety legislation

6.81 One particular issue which gives rise to concern is the slowness with which the State health and mine authorities acted in taking steps to regulate occupational exposure to asbestos. The association between exposure to asbestos dust and asbestosis had been well established by 1930,[90] while the association between lung cancer and asbestos was apparent by the late 1950s[91] Despite this, little attempt was made by the relevant government agencies to ensure the safe use of asbestos until very late in the day.

6.82 Given that knowledge of asbestos hazards was readily available in the technical and medical journals,[92] and given the much earlier introduction of legislation in other jurisdictions, most notably in the United Kingdom, it is disturbing that the relevant government departments took so long to enact protective legislation. The Committee suggests that the relevant government departments review their existing procedures for dealing with occupational health hazards to ensure that effective measures are taken to identify new hazards as they arise, and to promulgate legislation to protect workers and the public generally from those hazards.

Resources and enforcement strategy

6.83 Two factors are particularly important in understanding the inspectorates' role in relation to Baryulgil. The first is their lack of resources. This was at least a contributing factor in their failure to inspect more often, to undertake follow-up inspections or to take more vigorous enforcement action. In the case of the Mines Inspectorate, evidence was given that:

> There was a period from July, 1967 to January, 1974 when Special Duties Section was reduced from three inspectors to one inspector. This was due to an inability to recruit Inspectors of Mines. Thus the work in the dust area was delayed considerably.
>
> The same situation has arisen since the transfer of the Division to this Department.[93]

However, it is questionable whether the Mines Inspectorate's response to working conditions at Baryulgil would have been markedly different even if extra resources had been available. After all, there was no apparent difference in its role between 1967 and 1974 and in the years immediately before and after that period.

6.84 The second, and critical factor, influencing the inspectorates' responses at Baryulgil, was their underlying policy, which was to operate by advice, help and persuasion, and to invoke sanctions in only the most extreme circumstances. Such a policy is more reasily identifiable in the case of the Mines Inspectorate than in the case of the State Pollution Control Commission. The latter failed almost entirely to discharge its responsibilities in relation to Baryulgil and it was often difficult to identify any policy (apart from inertia) governing its actions. The policy of the Mines Inspectorate, on the other hand, was clear. As Mr Marshall, the Chief Inspector of Mines, put it:

> I will never be convinced that prosecution is the answer. The answer is the pyschology to get to the people and tell them to work safely.[94]

and again

> CHAIRMAN — So the policy of the Department was to convince people of the dangers and try to bring the standards up, bring the plant up . . .
>
> Mr Marshall — We wanted the plant to comply, yes.
>
> CHAIRMAN — Not to enforce?
>
> Mr Marshall — Not to enforce. The danger I see with enforcement — it might be not particularly true in this case — is that if you start prosecuting people for breaches of the Act your sources of information will dry up. People will not talk to you.[95]

The Chief Inspector also suggested that it would have been a misuse of limited resources to engage in prosecutions, since time spent in court fiving evidence could more usefully be spent in the field.[96] In any event, he suggested that prosecution would be futile in view of the low fines involved (the maximum, for much of the relevant period, being $200).[97] The Chief Inspector gave evidence that there had been a maximum of probably 10 prosecutions under the Act in as many years and that none of these had, to the best of his knowledge, been brought against any asbestos mine.[98]

6.85 This description of how the inspectorate approached its responsibilities is a familiar one, which characterises the work of similar agencies in New South Wales and throughout Australia.[99] It is part of a general philosphy, according to which the inspectorates choose to operate by advice and persuasion, assuming that the industry will almost invariably be willing to regulate itself, without the need for the law to be strictly or stringently applied.

6.86 It is this philosphy which largely explains why the Chief Inspector of Mines, Mr Marshall, saw no objection to a policy of giving advance notice of inspections, and why the inspectors themselves undoubtedly did so. This is why the Chief Inspector viewed the idea of 'surprise' inspections with some concern, as being an attempt to 'trap' employers, when the better approach was to try and clean-up the industry by liaising more closely with employers.[100] This is also why the inspectorate relied almost entirely on the goodwill of the employers to implement its recommendations, and why the employers knew that if they failed to do so, the chances of further action being taken against them, were remote.

6.87 The danger of relying entirely on this approach is that it may sometimes be cheaper to ignore safety precautions and risk occasional prosecution, and resulting fines, rather than to implement expensive injury prevention methods and engineering controls. This

point was made by the House of Representatives Standing Committee on Environment and Conservation it is report, *Hazardous Chemicals*, 1982:

> There are, in general, no dramatic work-stopping agents associated with asbestos-related diseases and industry would achieve negligible savings in production time by reducing their incidence. The benefits of reduced workers compensation premiums and tort claims has, until recently, been negligible and therefore, the total economic benefits to an employer of reducing asbestos hazards are minimal, as is the case for a wide range of occupational diseases . . . *In this instance it would appear necessary that legal standards be created and enforced in such a way that it is unprofitable to violate them* (emphasis added).[101]

6.88 With this conclusion we agree. Without denying the obvious value of the 'advise and persuade' philosophy in some circumstances, it is clear that it needs to be backed-up by effective sanctions. Vigorous enforcement of safetly legislation, together with more realistic penalties, is the mechanism most likely to curb work hazards.

Prior warnings of inspection

6.89 The practice of prior notifications of inspection is not confined to Baryulgil, but regrettably is widespread amongst the enforcement agencies.[102] Irrespective of the motivation for such warnings (which is generally an innocent one of administrative convenience) it is usually counter-productive. It allows time for the place to be cleaned up before the inspector arrives. Any possible breaches arising from failure to use protective equipment and provide protective gear can be avoided by bringing these out in time for the inspection. Thus, with a slim chance of an inspection due to the lack of staff provided for this purpose, with a warning beforehand, insufficient time for the inspector to investigate the premises thoroughly, and with only a notice to fear if any breach is detected, employers are under no real pressure to comply with the relevant safety legislation.

6.90 We find the practice of prior warnings to be inconsistent with the inspectorate's objective of reducing work hazards (except in limited circumstances where, for example, it is necessary to make prior arrangements for discussions with management).

CONCLUSIONS

6.91 There were serious shortcomings in the way the Mines Inspectorate administered occupational health and safety at Baryulgil. The practice of giving prior notification of inspections was particularly counter-productive. Its result was that inspectors rarely if ever saw conditions as they really were, and were not in a position to appreciate the true severity of the dust hazard.

6.92 The inspectorate also failed to conduct sufficiently frequent inspections and even when it did inspect (and discover excessive dust levels) it failed to use its powers to reduce the dust hazard. It relied soley on the good faith of the company in complying with its recommendations. it neither followed up those recommendations nor did it contemplate more vigorous enforcement action to ensure than an adequate program of dust control was implemented.

6.93 Little can be said about the way in which the State Pollution Control Commission performed its statutory functions at Baryulgil since it failed almost entirely to perform them at all.

6.94 Neither the Division of Occupational Health nor the Dust Diseases Board were regulatory agencies. The role of the former is to provide scientific, technical and advisory service, and that of the latter is primarily compensatory. They both discharged their responsibilities in relation to Baryulgil, by referring evidence of health hazards to the appropriate agencies, and in particular to the Mines Inspectorate.

6.95 Primary responsbility for conditions at the mine and mill at Baryulgil undoubtedly rests with the operating company. Whatever, or how far, shortcomings of the Mines Inspectorate and of the State Pollution Control Commission contributed to the amount of asbestos-related disease at Baryulgil, is not something which it is possible to establish. Even given the limited awareness of the hazard in the earlier period, it is doubtful how far the inspectorates satisfied the standard of performance that could properly be expected of them

ENDNOTES

1 See further paragraphs 6.48 to 6.77 and Apeendix III Chapter 2, below.
2 Section 36.
3 See generally, Transcript of Evidence, pp. 851–879.
4 This point is made by the Lidcombe Workers Health Centre in its submission to the Williams Committee. See *Report of Commission of Inquirty into Occupational Health and Safety*, Chairman T. Williams, NSW Gov. Printer 1981.
5 See Transcript of Evidence, pp. 730–777.
6 See further Appendix III, paragraphs 5.8 to 5.9.
7 See further Appendix III, paragraphs 5.8 to 5.9.
8 See further Appendix III, paragraphs 5.8 to 5.9.
9 See Chapter 4 above.
10 See Appendix III, paragraphs 5.10 to 5.15.
11 See Chapter 4.
12 Transcript of Evidence, p. 1129.
13 None of the District Inspectors gave evidence before the Committee.
14 See paragraph 5.23 above. It is reasonable to assume that, as in the case of all subsequent DOH tests, copies of the results were sent to the Mines Inspectorate.
15 *Grove* v *Bestobell Industries Pty Ltd* [1980] Qd.R.12.
16 See DOH Report of May 1963, which refers to the 'standard exposure concentration of 5 mpccf for asbestos dust Occupational Health Committee NH&MRC'.
17 See also Transcript of Evidence, p. 1083.
18 See generally, Transcript of Evidence, pp. 150–314.
19 Transcript of Evidence, p. 280.
20 Transcript of Evidence, p. 299.
21 Transcript of Evidence, p. 1066.
22 Transcript of Evidence, p. 1066.
23 Transcript of Evidence, p. 1061; see also Transcript of Evidence, p. 1430.
24 Transcript of Evidence, p. 2554.
25 Transcript of Evidence, p. 1062.
26 Transcript of Evidence, p. 2147.
27 Transcript of Evidence, p. 2147.
28 Transcript of Evidence, p. 211. cf. p. 2554.
29 For example Transcript of Evidence, p. 153.
30 Transcript of Evidence, p. 1071.
31 See, for example, Transcript of Evidence, pp. 57, 69, 155 and 208.
32 Transcript of Evidence, pp. 280–281.
33 Transcript of Evidence, pp. 280–281.
34 Transcript of Evidence, pp. 152–153.
35 Transcript of Evidence, p. 208.
36 Transcript of Evidence, pp. 2252–62.
37 Transcript of Evidence, p. 851.
38 Transcript of Evidence, p. 1131.
39 See above, paragraph 5.128.
40 See, for example, Transcript of Evidence, p. 4079.
41 See Table 3.

42 See Transcript of Evidence, pp. 1087–1088 and 1122–1124.
43 Transcript of Evidence, p. 848.
44 Letter from Chairman, Dust Diseases Board, to Director, DOH, dated 27/7/72, Transcript of Evidence, p. 857. The Committee was unable to obtain further information relating to the background of this letter.
45 On the defence of reasonable practicability, see Appendix III, paragraph 5.17. Given the dust control technology that was available (paragraphs 5.149 to 5.153) this defence need not have proved a major obstacle to bringing a prosecution.
46 See paragraphs 5.85 to 5.90.
47 *State Pollution Control Commission Act* No. 95 of 1970.
48 New South Wales *Government Gazette* No. 5 18 January 1963, p. 80.
49 Pp. 413–4. See also Appendix III, paragraph 2.43.
50 *Clean Air (Amendment) Act*, No. 92 of 1974, Section 3(1) (0).
51 See Appendix III, paragraph 2.63.
52 *Clean Air (Amendment) Act*, Section 3(1) (p).
53 Transcript of Evidence, pp. 38, 58–9, 196–7, and 2906–8.
54 Transcript of Evidence, pp. 196–7.
55 Transcript of Evidence, pp. 1405 and 1312.
56 New South Wales *Government Gazette* 1976, p. 2807.
57 See Appendix III, paragraphs 2.48 and 2.64. These sections were amended in 1974 by the *Clean Air (Amendment) Act*, Section 3(1) (j) and (k).
58 See Appendix III, paragraph 2.49.
59 When the mine closed — see paragraph 2.16.
60 Transcript of Evidence, p. 2936.
61 *Clean Air (Amendment) Act*, Section 3(1) (W).
62 *Clean Air (Amendment) Act*. Section 3(1) (x).
63 However, see the evidence of Mr Burke, Transcript of Evidence, p. 208.
64 Transcript of Evidence, p. 747.
65 Transcript of Evidence, p. 2134.
66 Transcript of Evidence, p. 747.
67 See paragraph 2.16.
68 Transcript of Evidence, pp. 207–8.
69 Transcript of Evidence, p. 747.
70 Transcript of Evidence, pp. 2123.
71 Transcript of Evidence, pp. 2162–3.
72 Transcript of Evidence, p. 208.
73 See paragraph 6.57.
74 Transcript of Evidence, p. 2119.
75 Transcript of Evidence, p. 2134.
76 Transcript of Evidence, p. 2162.
77 Transcript of Evidence, pp. 752–7.
78 Transcript of Evidence, p. 1807; and see paragraph 2.35.
79 See Appendix III, paragraph 2.67.
80 Report by Dr K. Basden submitted by the Aboriginal Legal Service and incorporated into the Records of the Inquiry as Exhibit No. 20.
81 Transcript of Evidence, p. 755.
82 Transcript of Evidence, p. 757.
83 Hereafter referred to as the Dust Diseases Board.
84 *Workers' Compensation (Dust Diseases) Amendment Act*, No. 98 of 1967.
85 Act No. 208 of 1983.
86 See Chapter 10 for an extended discussion of the compensation scheme.
87 Transcript of Evidence, 10 February 1984, pp. 1023–4.
88 Transcript of Evidence, 10 February 1984, p. 1135.
89 Transcript of Evidence, 10 February 1984, pp. 1155–7.
90 Chapter 3 above and see in particular Home Office (U.K.) *Report on the Effects of Asbestos Dust in the lungs and dust suppression in the asbestos industry*. Merewether and Price HMSO 1930.

91 In 1955 Doll conclusively established a tenfold greater risk of contracting lung cancer in asbestos workers. Doll R. Mortality from Lung Cancer in Asbestos Workers *British Journal of Industrial Medicine XII* 1955, pp. 81–82. See also *Cancer in NSW, Incidence and Mortality* 1974, NSW Cancer Registry, Health Commission of NSW, p. 14.
92 See references in Chapter 3.
93 Transcript of Evidence, p. 1120.
94 Transcript of Evidence, p. 1124.
95 Transcript of Evidence, pp. 1122–23.
96 Transcript of Evidence, pp. 1087–88.
97 Transcript of Evidence, p. 1116.
98 Transcript of Evidence, p. 1086.
99 See Workers Health Centre, Lidcombe; Submission to N.S.W. Inquiry into Occupational Safety and Health 1979/81 (The Williams Inquiry), p. 9; Carson W.G. 10 British Journal of Criminology 383–398; Cranston R. and Thornton J., 'Persuasion or Prosecution' 1979 Legal Service Bulletin 24, Gunningham N. *Safeguarding the Worker*, Law Book Co. 1984, 345–354; Hopkins A. and Parnell N. 'Why Coal Mine Safety Regulations are not Enforced' International Journal of Sociology of Law 1984, 12, 179–194.
100 Transcript of Evidence, p. 1064.
101 See House of Representatives Standing Committee on Environment and Conservation, Second Report on Hazardous Chemicals, AGPS 1982, 1113. See also Hall T. 'The Ugly Face of Australian Business' (Sydney 1980) Chapters 2, 3; Layman L. 'Occupational Health at Wittenoom 1943–1966'. Paper presented to the ANZ SERCH/APHA Conference, University of Adelaide May 1984; Peacock M. *Asbestos: Work as a Health hazard* ABC, Sydney 1978.
102 Kriegler *Working for the Company* Melbourne U. P. (1980) 19, 56, 65; Report of the Parliamentary Commissioner for Administration Mr Max Madden, C253/V 1976; Layman L. 'Occupational Health at Wittenoom'.

Chapter 7

The health of ex-mine workers and residents of Baryulgil

NEW SOUTH WALES DEPARTMENT OF HEALTH SURVEYS

7.1 The most comprehensive sources of data on the health of former workers and residents of Baryulgil are reports of surveys conducted in 1977, 1981 and 1982 by the New South Wales Department of Health.[1]

1977 Survey

7.2 The first investigation was undertaken because of a report in 1974, by Dr John Ward of the Aboriginal Health Section of the Health Commission, that mine workers, although symptom free for the first 10 to 15 years of their employment, then developed chronic cough and sputum production, recurrent chest infections and shortness of breath, initially only with exertion but later at rest.

7.3 The first surveys attempted to trace all accessible ex-mine workers (used hereafter to refer to ex-workers in the mine and mill) who had worked at Baryulgil for more than 12 months. Records of 208 ex-mine workers were found of whom 136 were believed to be alive and 105 were examined. Of the remainder, 67 were dead the the status of five was not known. This survey covered 197 aboriginal men from the same area of New South Wales, resident in nearby townships, who had not lived or worked at Baryulgil. This 'control' group was, on average, slightly younger than the mine workers and had a higher proportion of current smokers (77% as compared with 67%) the difference being largely due to a higher prevalence of light smokers, 1–10 cigarettes per day, among the controls. In other respects, it was similar to the mine workers. A group of 44 women, 12 non-miner men and 10 children who were present or past residents of Baryulgil was also studied.

7.4 Data were obtained on work and residential history, smoking habits and respiratory symptoms. Chest x-rays were taken and lung function studies performed. Forty two per cent of the men had worked at Baryulgil for less than one year, 33% for 1–5 years, 17% for 6–10 years and 8% for 11 years or more. Fifty per cent were observed in under 11 years from first employment, 32% in 11–20 years and 18% in over 20 years.

7.5 'Chronic bronchitis' (defined as daily cough with sputum production for at least three consecutive months of the year for at least the past two years) was common in both ex-mine workers and controls. The crude prevalence was 70% in the ex-mine workers and 40% in the controls. This difference was statistically significant after adjusting for the effects of age and smoking. Prevalence of chronic bronchitis showed little tendency to increase with time since first employment or increasing duration of employment in the mine. The women and children surveyed had a substantially lower prevalence of chronic bronchitis (37% overall or 51 in those aged 26 years or over) than the ex-mine workers, and less also than the male controls after adjusting for the effects of age and smoking.

7.6 There were no substantial differences between ex-mine workers and controls in results of the lung function studies. Indeed, after taking account of effects of age, height and smoking, transfer factor was significantly higher in the ex-mine workers than the controls. This result casts some doubt on the *a priori* comparability of the ex-mine workers and controls. In ex-mine workers, however, there was a tendency for transfer factor to fall with time since first exposure and increasing duration of employment.

7.7 Eight (7%) of the ex-mine workers, but none of the control subjects, showed x-ray evidence of asbestos-related disease. Four had pleural thickening, and four had evidence of interstitial fibrosis and one of the latter also had a possible pleural plaque.

7.8 No ex-mine worker showed all the features required for a diagnosis of asbestosis (history of asbestos exposure with bilateral basal crepitations, x-ray evidence of diffuse interstitial fibrosis and relevant impairment of lung function). One subject had bilateral basal crepitations, x-ray changes and both vital capacity (FVC) and forced expiratory volume in one second ($FEV_{1.0}$) reduced to 70% of the value predicted from the control group. He was referred to the Workers' Compensation (Dust Diseases) Board of New South Wales for assessment.

7.9 An analysis of mortality was attempted based on the 67 deaths which had been identified among ex-mine workers. Two out of three ex-mine workers who had been examined post mortem had been found to have evidence of asbestosis. Nine (11%) ex-mine workers had died from respiratory illnesses.

7.10 Mortality rate analyses were based on 67 ex-mine workers who had lived in Baryulgil since 1965. Fifty-two per cent of these men had first worked at the mine since 1965 and 51% had worked there for greater than five years. Fifteen had died. Based on the mortality experience of all aboriginal male residents in country town in New South Wales the expected number of deaths was 12.8 (i.e. two less than the number observed). No data were provided to indicate how complete was ascertainment of the population resident in Baryulgil since 1965 and whether or not all deaths were likely to have been found.

1981 Survey

7.11 The objective of the 1981 survey was to re-examine all those men who were seen in 1977 and any other surviving ex-mine workers who could be located. Ninety were examined, 80 from among those seen in 1977 and 10 who had been newly located. Of those seen in 1977, 16 had died and nine refused re-examination. The examination conducted was similar to that conducted in 1977.

7.12 Prevalence of chronic bronchitis was again high at 68%. There was again little evidence to suggest that prevalence of bronchitis increased with increasing duration of employment at Baryulgil.

7.13 Lung function tests showed some change in mean values between 1977 and 1981 in those men who were examined on both occasions — FVC, $FEV_{1.0}$ and transfer factor each fell. The fall in transfer factor and the absolute value of transfer factor were significantly related to length of employment at the mine after taking the effects of age and smoking into account.

7.14 Seven subjects showed unequivocal pleural plaques on chest x-ray, none showed definite evidence of interstitial fibrosis.

7.15 Of the sixteen men who had died since 1977, two (12.5%) had died from respiratory disease (bronchopneumonia).

1982 Survey

7.16 In 1982 a total of 41 mine workers were examined: 31 out of 36 who had been seen in 1981 and recommended for re-examination in 1982, seven out of nine examined in 1977 but not examined in 1981, and three out of 21 known alibe but not examined at either of the two earlier surveys. With these three additional subjects, 94% of the mine workers ascertained by the Department of Health and known to be alive had been examined at least once.

7.17 The only new finding was a calcified pleural plaque in one subject who had been examined both in 1977 and 1981.

DATA COLLECTED AND COLLATED BY THE ABORIGINAL LEGAL SERVICE, THE OCCUPATIONAL HEALTH SUBCOMMITTEE OF THE DOCTORS REFORM SOCIETY AND THE ABORIGINAL MEDICAL SERVICE

7.18 In addition to the three surveys conducted by the New South Wales Department of Health, data on health and disease in mine workers and residents from Baryulgil have been brought together by the Aboriginal Legal Service in collaboration with the Occupational Health Subcommittee of the Doctors Reform Society and the Aboriginal Medical Service[2]. They have been obtained in a variety of ways but mainly, through presentation of a signed release, from the New South Wales Department (records of 49 men surveyed in 1977, 1981 or 1982), or through referral of individuals who had been more heavily exposed or now have symptoms to Dr Christopher Clarke (17 ex-mine workers and five workers wives) or Dr Maurice Joseph (four ex-mine workers).

7.19 It is not possible from these selected data to form any clear or quantitative impression of the extent of asbestos related disease in the Baryulgil aborigines. Relevant facts, however, do emerge from them and are summarised below, in part, under the headings used in a submission from the Occupational Health Subcommittee of the Doctors' Reform Society.[3]

Asbestosis in surviving ex-mine workers

7.20 It is the opinion of the Occupational Health Subcommittee of the Doctors Reform Society that thirteen surviving ex-mine workers have clinical features suggestive of asbestosis. The evidence presented to the Committee on the health of these workers was reviewed by the medical consultant to the Committee. A diagnosis of 'possible asbestosis' was assigned if, in addition to asbestos exposure, one of the following was present — persistent bilateral basal inspiratory crepitations, chest x-ray changes suggestive of asbestosis (not including pleural thickening or pleural plaques) and relevant abnormality of lung function (evidence of reduced lung volume or reduced transfer factor based on commonly accepted Australian standards). 'Probable asbestosis' was assigned if two or more of these additional features were present. In the medical consultant's opinion six of the 13 ex-mine workers considered by the Doctors Reform Society to have clinical features suggestive or asbestosis had 'possible asbestosis' and four had 'probable asbestosis'. There is in addition, one other not detailed by them with 'possible asbestosis' and one with 'probable asbestosis'.

7.21 The comparative rarity of x-ray changes suggestive of asbestosis is notable in these cases. In only two was there x-ray evidence of interstitial fibrosis.

Asbestosis at post mortem examination in ex-mine workers

7.22 Histopathological reports were available on tissue from the lungs taken at post mortem from three ex-mine workers. Evidence of asbestosis was present in all three. It does not appear to have been of a serious degree and it is not at all clear that it contributed to death in any of these subjects, although one certainly died of respiratory disease. One of these subjects had been classified as 40% disabled by asbestosis by the Workers Compensation (Dust Diseases) Board (NSW).

Other evidence of asbestosis in ex-mine workers

7.23 There is some suggestion of asbestosis in four other subjects. Two are now dead but had chest x-rays taken at Grafton Base Hospital in 1949 and 1952. One of these was reported as showing changes (progressive) suggestive of asbestosis on both occasions, the other showed these changes only at the second examination. The other two subjects detailed under this heading by the Occupational Health Subcommittee of the Doctors'

Reform Society are suing the company which operated the mine on account of alleged asbestosis. One has a chest x-ray showing 'diffuse interstitial fibrosis with greatest involvement in both lung bases'.[4] Nothing is known of the other.

Asbestos-related cancer

7.24 Two mesotheliomas are known to have been diagnosed in people with some association with Baryulgil. One, a white man, was mine engineer and fitter at Baryulgil for 25 years and had malignant mesothelioma of the pleura diagnosed in 1984.

7.25 The second is an Aboriginal woman with malignant mesothelioma of the peritoneum diagnosed in 1983. Details of her connection with Baryulgil are unclear but she is believed to have lived there for a few months in the 1960s.

7.26 A full occupational and residential history of the subjects would need to be obtained, however, to exclude the possibility of the disease having been contracted elsewhere or in other employment.

7.27 Only one case of lung cancer is known to have been diagnosed in a Baryulgil Aboriginal. It occurred in a 51 year old woman who had no occupational exposure to asbestos but lived in Baryulgil for most of her adult life. Histopathological examination of the resected lung showed 'mild patchy interstitial fibrosis'. Phase contrast microscopy showed both coated and uncoated asbestos fibres in numbers considered to be 'within normal limits for an urban population'.

MORTALITY ANALYSES

7.28 The results of mortality analyses undertaken by the New South Wales Department of Health have been described above. An analysis of a different set of deaths was undertaken by Dr G.B. Field.

7.29 Dr Field's analysis[5] was based on what was described as 'a list of all personnel employed in the Baryulgil mine and mill from its (sic) inception . . . provided by James Hardie Industries from Company records'. The list totalled 337 men and was thought possibly to be incomplete for the early years of the operation. It was submitted to the Registrar General of Births, Deaths and Marriages of New South Wales with the request that the names be searched in the Death Register; 49 death certificates were located. Seven (14%) of these 49 men had a respiratory disease given as the underlying cause of death, four more had respiratory disease listed among other conditions mentioned on the death certificate. In one case only, asbestosis was mentioned on the death certificate. No death was attributed to lung cancer or mesothelioma. No attempt was made to calculate mortality rates or compare mortality experience of these men with that of another population.

7.30 There are substantial differences between the mortality analyses undertaken by the New South Wales Department of Health and Dr Field which make their reconciliation difficult and raise doubts about the data on which they are based. The New South Wales Department of Health, in a search for men who worked at Baryulgil for more than 12 months found 208, at least 74 of whom had, in fact, worked there for less than 12 months. Among these 208 men, 83 deaths were identified. Dr Field had a near complete list of ex-mine workers from Baryulgil totalling 337 and found only 49 deaths. Neither study addressed critically issues or completeness or correctness of ascertainment of the workforce or the deaths nor, as far as we know, has any attempt been made to reconcile the results of the two studies.

OCCURRENCE OF ASBESTOS-RELATED DISEASE

7.31 For the purposes of this discussion, asbestos-related disease in ex-mine workers and other present and former residents of Baryulgil will be considered under the following headings:

Asbestosis (i.e. diffuse interstitial fibrosis of the lungs)
Benign pleural disease (including pleural thickening and plaques and benign pleural effusion)
Malignant mesothelomia of the pleura and peritoneum
Cancer of the lung

Other possibly asbestos-related cancers will not be considered mainly because no specific information has been provided on them in this population. The occurrence of one death from cancer of the oesophagus was noted by Dr Field.

7.32 The question of chronic bronchitis will also be discussed because it may be asbestos-related or could be due to exposure to other dust associated with asbestos at Baryulgil.

Asbestosis

7.33 It is clear that asbestosis has occurred in ex-mine workers from Baryulgil. It was present, at least to a mild degree, in the lungs of three who were examined post mortem and also in the lung of a woman who developed lung cancer, who had not been employed in the mine or mill but had lived in Baryulgil for most of her working life. On clinical grounds also, given the evidence available to us, at least five living ex-mine workers probably have asbestosis. It would appear, however, that it is not severe in comparison with what is commonly observed in circumstances of long-term occupational exposure. A number of other ex-mine workers have some of the clinical features of asbestosis.

7.34 In formulating an opinion about the likely presence or absence of asbestosis in ex-mine workers, the Committee's medical consultant made no allowance for racially determined differences between Aboriginal and non-Aboriginal Australians in the 'normal' values of lung function tests. Lung function does appear to vary racially[6] and there are at least some suggestions that vital capacity and therefore lung volume and transfer factor may be lower in Aboriginals that Caucasians.[7] The data available on Aboriginals, however, are insufficient for a firm conclusion and, in the absence of better data, it is appropriate to adopt a conservative point of view.

Benign pleural disease

7.35 Pleural thickeing and pleural plaques rarely give rise to symptoms but may serve as indicators of significant asbestos exposure. In the 1977 New South Wales Department of Health Survey, five out of 105 ex-mine workers had pleural thickening (4 subjects) or a pleural plaque (one subject). In the 1981 survey seven of 90 ex-mine workers had pleural plaques. In the clinical information collated by the Aboriginal Legal Service and others there were chest x-ray reports describing pleural plaques in five subjects and pleural thickening in two. These may be some of the same subjects as were uncovered with these conditions by the New South Wales Department of Health Surveys. We have seen no record of anyone purported to have a benign pleural effusion.

Malignant mesothelioma of the pleura and peritoneum

7.36 In comparison with other circumstances of asbestos exposure, malignant mesothelioma of the pleura is uncommon in miners and millers of chrysotile.[8] Malignant mesothelioma of the peritoneum appears to be very rare in persons exposed only to

chrysotile.[9] One case of malignant mesothelioma of the pleura and one of malignant mesothelioma of the peritoneum have been diagnosed in persons with some exposure to asbestos at Baryulgil. The pleural mesothelioma might reasonably be attributed to this exposure, however, it would be necessary to obtain a complete occupational history of the employee concerned to exclude the possibility of exposure to asbestos in other employment. Attribution of the peritonal mesothelioma is more uncertain; the sufferer, an Aboriginal woman, lived in Baryulgil for only a short time and did not work in the mine or mill. As mentioned above, peritoneum mesothelioma has rarely been associated with exposure only to chrysotile and, even if exposure to crocidolite and amosite did occur in the mill as a consequence of the re-use of bags, we have no evidence to suggest that this woman shared in this exposure.

Lung cancer

7.37 Only one person with lung cancer has been found among ex-mine workers and residents at Baryulgil; a 51 year old woman who lived in Baryulgil for most of her adult life and smoked 10 cigarettes per day for 25 years to the time of diagnosis of her cancer. The cancer was an adenocarcinoma and there was 'mild patchy interstitial fibrosis of the adjacent lung tissue with both coated and uncoated asbestos fibres visible under phase contrast microscopy.'[10] The possibility that asbestos exposure contributed to the cause of this cancer must be accepted.

Chronic bronchitis

7.38 An increased prevalence of the symptoms of chronic bronchitis has been discovered in asbestos-exposed populations whether or not they were also exposed substantially to other dusts.[11] Chronic bronchitis appears to occur as a consequence of occupational exposure to a variety of dusts.[12]

7.39 The medical consultant to the Committee is of the view that in deciding whether or not occupation contributed to the apparently high prevalence of chronic bronchitis in ex-mine workers from Baryulgil, the known high prevalence of bronchitic symptoms in Aboriginals must be taken into account.[13] Gandevia observed a high prevalence of one or more of 'history of acute chest illness in the past two years', 'loose cough upon request' and 'adventitious sounds' in Pintubi and Walbiri Aboriginals as compared with Caucasian Australians. In the Pintubi and Walbiri Aboriginals who had been at Papunya for some time, however, the prevalence of one or more of these symptoms or signs was 25–35%, substantially less than the prevalence of chronic bronchitis (daily cough with sputum production for at least three consecutive months of the year for at least the past two years) in the ex-mine workers from Baryulgil (70%). In a survey of Aboriginal adults in Bourke, NSW, Kamien[14] found a prevalence of 25% for chronic or recurrent respiratory disorder in men.

7.40 The medical consultant considers that while there are undoubtedly problems of comparability between the NSW Department of Health Survey and these surveys with respect to methods, age distribution of the population, prevalence of smoking etc, it does appear likely that the ex-mine workers do have a higher than expected prevalence of chronic bronchitis. The comparison with control subjects studied by the N.S.W. Department of Health also pointed in this direction. He observed, however, little evidence of any tendency towards increased prevalence of chronic bronchitis either with duration of employment in the mine or mill or with time since first employment. This is against a simple causal interpretation of the results. However, the Committee's medical consultant considers that a causal connection between dust exposure at Baryulgil and chronic bronchitis must remain a possibility.

IMPACT OF ASBESTOS-RELATED DISEASE ON THE BARYULGIL ABORIGINALS

7.41 The preceding sections show that asbestos-related disease occurred in the Baryulgil Aboriginals. Asbestosis certainly and pleural thickening and plaques have occurred. Whether or not the apparently high prevalence of chronic bronchitis among the ex-mine workers, perhaps the main present source of ill-health, was due to their employment is less certain.

7.42 The medical consultant considers that it is difficult to give any overall assessment of the impact of asbestos-related disease on this population and there are a number of reasons for this difficulty:

(a) The population 'at risk' is not known with any certainty. The NSW Health Commission identified 208 ex-miner workers, Dr Field obtained records of 337 from Hardie Industries. The Aboriginal Legal Service provided the Committee with a list of 366 'people who worked at the Baryulgil mine.' Not all of these on the Aboriginal Legal Service list could be confirmed as ex-employees by Hardie Trading.

(b) The population at risk is poorly characterised. Date of birth, date of commencement and termination of employment and duration of employment are missing from the records of many of the ex-mine workers listed by the Aboriginal Legal Service. There is possibly a consistent bias in the missing data because only 8 of the 244 for which a date of first employment was given were employed before 1955. Hardie Trading also recognizes that its records are incomplete for the earlier years of the operation.

(c) Follow-up information is incomplete. Difficulty in actually establishing who worked at Baryulgil has hindered attempts at obtaining follow-up information. While Dr Field had the most complete list used for this purpose to date, it appears likely that this ascertainment of deaths was deficient. In any case, the lack of ready access to medical care at Baryulgil will render difficult any attempt at historical reconstruction or the development of asbestos-related disease in this population. There may be historical records yet to be accessed, such as records of regular health-screening of the workforce, but they have not come to light.

7.43 The medical consultant has concluded that deficencies in the data available mean that, at present at least, it is impossible to calculate rates of past disease or to project future likely rates of disease. The impossibility of any valid projection is particularly determined by the uncertainty regarding time of first employment and duration of employment as well at the actual levels of exposure to asbestos during employment, which would be critical inputs into any projection process.

7.44 The difficulties in making any precise quantitative statements about asbestos-related disease in the Baryulgil workforce are multiplied many times for those who only resided in the town. No known attempt has been made to enumerate this population or describe its characteristics. Nor has it been followed up. A few case reports suggest that asbestos-related disease may have occurred in it but they give little indication of the likely past, present or future extent.

FUTURE STUDIES OF THE HEALTH OF EX-MINE WORKERS FROM BARYULGIL

7.45 It is clear from the above that if a clearer picture of the health of ex-mine workers from Baryulgil, or a more certain projection to the future, is required, further research will be necessary. The existence of some as yet unused records and the lack of collation of already identified and used sources of information on the ex-mine workers suggest that

such research would probably be informative. The same probably does not apply to residents of the town for whom adequate data are unlikely ever to become available.

7.46 The first step in undertaking further studies would be amalgamation of all available data on persons employed at the Baryulgil mine or mill. The minimum data necessary on each person would be full name, date of birth, ethnic origin, date of beginning of first employment spell at Baryulgil and total duration of employment. Dates of beginning and end of each employment spell would be highly desirable if available.

7.47 To this data base defining the workforce and its exposure history should be added all currently available follow-up information (including abstracts of medical and health records and other relevant information such as smoking history). As a minimum the names of all those in the data base not known to be dead already should be searched in the NSW and Queensland death registers to find dates and causes of death.

7.48 Those people not known to be dead should be located as far as possible and examined in a manner similar to that used by the NSW Health Commission in the 1977 survey. Every effort should be made to obtain some data from each subject even if they cannot be examined or even contacted directly. The need for any additional studies after this would be determined by the results of analyses of these investigations.

ENDNOTES

1 Division of Occupational Health submission, Transcript of Evidence pp. 896–964.
2 Transcript of Evidence pp. 313–579.
3 Transcript of Evidence pp. 318 to 579.
4 This was concluded by the medical consultant on the basis of a x-ray report of the person concerned made available to the Committee on a confidential basis.
5 Transcript of Evidence pp. 1675–1713.
6 Oscherwitz, M., Edlavitch, S.A., Baker, T.R. and Jarboe T. *Diffferences in pulmonary functions in various racial groups*. American Journal of Epidemiology 1972, 319–327; and also Woolcock, A.J., Colman, M.H. and Blackburn, C.R.B. *Factor's affecting normal values for ventilatory lung function*, American Review of Respiratory Disease 1972; 106: 692–709.
7 Transcript of Evidence pp. 2261–2.
8 Acheson, E.D. and Gardner, M.J. *The ill effects of asbestos on health. In Health and Safety Commission Asbestos*, (Vol. 2.) final report of the advisory commitee. Papers commissioned by the committee. London: Her Majesty's Stationery Office. 1979: 7–83.
9 Dupre J.S., Mustard, J.F. and Uffen R.J. *Report of the Royal Commission on Matters of Health and Safety Arising from the Use of Asbestos in Ontario*, Vol. 1. Toronto: Ontario Ministry of the Attorney General 1984, pp. 244–256.
10 Transcript of Evidence p. 2193.
11 Becklake, M.E. *Asbestos-related diseases of the lungs and pleura*, in current clinical issues. Canadian Medical Association Journal.
12 Morgan, W.K.C. *Industrial bronchitis*, British Journal of Industrial Medicine 1978, 35; p. 287.
13 Gandevia, Brian — *The Prevalance of Signs of Chronic Respiratory Disease in Pintubi and Walbiri Aborigines at Papunya, Central Australia and Warburton, Western Australia* — The Medical Journal of Australia, 1967 No. 5: 237 (August 5).
14 Kamien, M. *The physical health of aboriginal adults in Bourke*, NSW Medical Journal of Australia 1976; 1: pp. 38–44.

Chapter 8

Existing legal remedies available to the Baryulgil community, their problems and chances of success

8.1 Paragraph 3 of the Committee's Terms of Reference require it to inquire into and report on:

> provisions currently available to secure just compensation for individuals who have been adversely affected by the mining and processing activities at Baryulgil, and measures necessary to overcome any inadequacies in those provisions.[1]

In Chapter 1, the Committee quoted at some length[2] from the submission of the Aboriginal Legal Service to the Minister for Aboriginal Affairs seeking this Inquirty. That quotation shows that one of the major reasons of the Aboriginal Legal Service for seeking the Inquiry was their contention that existing legal remedies were inadequate to provide proper compensation to members of the Baryulgil community suffering from asbestos-related disease.

8.2 Appendix III contains a detailed legal analysis, prepared for the Committee, of the availability of existing legal remedies to members of the Baryulgil community. On the basis of that analysis, the Committee considers that there are a number of remedies reasonably available to persons within all of the various groups into which the community could be divided — former workers, dependants of deceased former workers, residents and former residents of Baryulgil Square, dependants of deceased residents — if such persons are found to be suffering from asbestos-related disease. In so far as there are problems involved in those remedies, they are problems which (with one exception[3]) are faced by all persons bringing such actions, and do not arise out of the particular circumstances of the Baryulgil people. The Committee has made suggestions and recommendations in Chapters 9 and 10 aimed at eliminating those problems. Subject to those suggestions and recommendations, the Committee believes the existing legal remedies are adequate. The Committee's reasons for that conclusion are summarised in the remainder of this Chapter.

NEGLIGENCE ACTIONS BY WORKERS AGAINST THE EMPLOYER[4]

8.3 Employees who contract diseases as a result of the negligence of their employer are entitled to claim the resultant loss from their employer as damages. It is necessary that they establish that, but for some act of the employer, they would not have contracted the disease; that the contraction of that disease was a foreseeable consequence of the employer's act; that there were practicable precautions available, which would probably have prevented the contraction of the disease, which the employer failed to take; and that a reasonable employer would have taken those precautions. Since the action is against the employer, in the event of actions by former Baryulgil workers, the action would be against the subsidiary company, Asbestos Mines Pty Ltd, unless the court was prepared to lift the corporate veil and treat the whole Hardies Group or the whole Woodsreef operation as a single employing company.

8.4 It appears to the Committee, on the basis of Appendix III, that a Baryulgil worker claiming damages against Asbestos Mines Pty Ltd would have little difficulty in establishing causation, foreseeability, the availability of precautions, and that a reasonable employer would have taken those precautions, if the disease for which the plaintiff claims damages is asbestosis or mesothelioma, but that the plaintiff might not be

able to prove causation if his disease were bronchogenic carcinoma and he is, or during the period of exposure was, a smoker.

8.5 If the courts were prepared to lift the corporate veil and allow an action against the parent company, this would create no extra problems where the claimant worker had been employed only during the Woodsreef period (September 1976 to April 1979). If the worker's employment had spanned the sole, and his disease were asbestosis, both parent companies would have been responsible at various times for the exposure which cumulatively caused his disease. He could join both as defendants and damages would be apportioned between them. But if the disease were mesothelioma, only one of the two parent companies would have been responsible for the particular exposure which had caused the disease, and — because of the long but variable latency period — it would not be possible to establish whether that particular exposure was before or after September 1976. He would thus be unable to establish causation against either parent company. However, his action against the subsidiary would still be available.

8.6 Damages awarded against an employer can be proportionately reduced where the emloyee has, by his own unacceptable carelessness, contributed to the injury. It does not appear likely, given the circumstances of Baryulgil workers — their isolation, standard of education and lack of clear knowledge of the hazards — that a court would find they had been contributorily negligent.

8.7 Actions for damages can normally be brought only if proceedings are commenced within six years of the injury or contraction of disease. This can create difficulties where the disease is of long latency — as are asbestosis and methothelioma. However, Sections 57 and 58 of the *Limitation Act* 1969 (N.S.W.) allow an extension of the six year period if the plaintiff did not know and could not reasonably have known of material facts — such as the existence of the disease — within the six years. This provision for extension appears to be wide enough to allow actions to be brought by Baryulgil workers even if their diseases were contracted more than six years ago.

8.8 Thus, an award of damages to a Baryulgil worker against Asbestos Mines Pty Ltd is a strong possibility. However, that company has no funds to pay the damages, and the worker would have to rely on the award being satisfied by the insurance policies of Asbestos Mines Pty Limited. If the insurance policies contained limitations on the insurer's liability for individual claims, and if those limitations were set at a sum less than the amount of damages awarded, the worker would be unlikely to receive more than the amount for which the insurer is liable. This problem would not be as great if the action were brought against the parent companies, since they — or at least the Hardie group — have funds to meet the shortfall. However, it is unlikely that courts would agree to actions against the parent companies.

NEGLIGENCE ACTIONS BY DEPENDANTS OF DECEASED WORKERS AGAINST THE EMPLOYER[5]

8.9 Where a person injured by the negligence of another dies of those injuries before bringing an action for damages, by the *Compensation to Relatives Act* 1897 (N.S.W.), the deceased's wife, husband, brother, sister, half-brother, half-sister, parent or child can bring an action against the person responsible for the death, for the loss of expected financial support.

8.10 In order to establish the responsibility of an employer for damages in such an action, the matters which the dependants would have to prove are the same matters set out in paragraph 8.3. Such an action brought by dependants of a deceased Baryulgil worker against Asbestos Mines Pty Ltd would thus have a good chance of resulting in an award of

damages. However, the same problems concerning full payment of the award (discussed in paragraph 8.8) would apply.

8.11 Because the Act establishing this right of action does not cover de facto relationships[6] or tribal marriages, if the dependants of a deceased Baryulgil worker based their claim on such a relationship they would encounter difficulties. A de facto or tribal spouse of a deceased worker would be unable to claim. The children of such a relationship would not have difficulty because the *Children (Equality of Status) Act* 1976 (N.S.W.) gives ex-nuptial children the same rights as nuptial children. The father of a deceased worker would have to bring evidence to establish paternity. The brothers and sisters of the worker would have to bring evidence to extablish that the worker was the child of the same biological parents as they. Half-brothers and half-sisters of the worker, where the shared parent was the father, would have to bring evidence that the father was the biological parent both of themselves and of the worker. However, these evidentiary requirements could fairly easily be met, and all 'relatives', other than the de facto or tribal spouse, should be able to claim.

8.12 Action can also be brought by the estate of a deceased person, under the *Law Reform (Miscellaneous Provisions) Act* 1944, against a person whose negligence caused injury to or the death of the deceased person for any earnings lost or medical expenses incurred, as a result of negligence, between the injury or contraction of disease and the death. In order to prove the negligence, the elements discussed in paragraph 8.3 would have to be established. As already stated, that should present little problem in the case of deceased Baryulgil workers.

8.13 There would only be difficulty in the action on behalf of the estate, if the deceased left no will, and had been living in a de facto relationship or tribal marriage, since persons (other than children) claiming through such relationships would not be able to seek a grant of letters of administration in order to bring the action or to benefit in a distribution of the estate as their relationship is not recognised by the *Wills, Probate and Administration Act* 1898 (N.S.W.).

BREACH OF STATUTORY DUTY ACTION BY WORKERS[8]

8.14 Where a person is injured as a result of a breach of statutory duty by his or her employer, that person may bring a common law action for damages, if the particular duty breached is interpreted by the courts as showing the intention of the legislature to give private rights of action for its breach as well as a right of prosecution.

8.15 In order to succeed in such an action, the injured person must show first that the section or regulation imposing the duty gives a private right of action, second that the employer's act did in fact amount to a breach of the duty, third that the breach itself caused the injury, and finally that the injury was of the type against which the section or regulation intended to give protection.

8.16 As a general rule, industrial safety statutes are interpreted as giving private rights of action for breach. The relevant statute in the case of actions by Baryulgil workers against their employer is the *Mines Inspection Act* 1901 (N.S.W.). The sections of the Act which imposed on Asbestos Mines Pty Ltd duties which may, on the evidence discussed in Chapter 5 of the Report, have been breached, and whose breach may have caused injury, are Section 30 and Section 55 General Rules 8 and 65B.

8.17 Section 30 requires that no person operate machinery for more than eight consecutive hours or for more than eight hours in any twenty-four. However, Section 30 (w) makes it clear that the purpose of the section is to prevent careless work by machine operators resulting in damage to the machinery. Therefore, while the section might be

interpreted as giving a private right of action, and while the negligence of a weary operator might result in excessive emission of asbestos fibre from the milling machinery, thus increasing the exposure to asbestos fibre of his fellow workers and contributing to their contraction of an asbestos-related disease, the contraction of disease by fellow workers is clearly not the type of injury against which Section 30 intended to give protection. Thus, even if evidence of breach of Section 30 by Asbestos Mines Pty Ltd were forthcoming, it would not found a successful damages claim by Baryulgil workers seeking compensation for an asbestos-related disease.

8.18 General Rule 8 of Section 55 requires all mine machinery to be kept in a fit state and condition for work to the satisfaction of an inspector. This General Rule would probably be held to give a private right of action to a worker in the mine. There is evidence that the milling machinery at Baryulgil was not always in a fit state and condition for work, at least if 'fit state and condition' includes a state and condition that does not involve the emission of levels of fibre above the set standards. However, for there to have been a breach, that state and condition must have incurred the dissatisfaction of an Inspector. It would thus appear that given the apparent satisfaction of the Mines Inspectorate with the operations at Baryulgil (a satisfaction that the Committee questions in Chapter 6), a worker attempting to found an action on this General Rule would be unable to succeed because of an inability to establish that there had been a breach.

8.19 In 1964, General Rule 65B set a limit of airborne asbestos fibre of 5 million particles per cubic foot of air. In 1973, this was amended to 4 fibres per cubic centimetre, and, in 1978, to 2 fibres per cubic centimetre.

8.20 This Rule would certainly give a private right of action. Chapters 5 and 6 detail a number of occasions where these standards were exceeded, either on the evidence of Mines Inspectorate reports of dust counting, or on the evidence of Hardies own dust counting, obtained from the Burke documents. However there could still be a problem for a Baryulgil worker, bringing an action based on General Rule 65B, to prove that a breach had occurred, since the reports would be regarded as hearsay and not admissable in evidence, and it would be necessary to call as a witness the person who actually performed the dust counting in question.

8.21 If that evidentiary problem were overcome, the plaintiff should have little difficulty in establishing the other elements of an action based on General Rule 65B.

8.22 Actions for breach of statutory duty are also subject to the *Limitation Act* 1969 (N.S.W.) and to the six year period in which an action may be brought, but the extension of time provided by Sections 57 and 58 would in all probability be available in the case of any action by a former worker, as suggested in paragraph 8.7.

BREACH OF STATUTORY DUTY ACTIONS BY DEPENDANTS OF DECEASED WORKERS[9]

8.23 Where a person dies as a result of an injury caused by a breach of statutory duty, his or her dependants can bring an action under the *Compensation to Relatives Act* 1897 for loss of expected financial support. Dependants of Baryulgil workers who die as a result of an asbestos-related disease should therefore, subject to the evidentiary difficulties discussed in paragraph 8.20, have a good chance of success in an action for breach of General Rule 65B of the *Mines Inspection Act* 1901. The problems connected with de facto relationships (and tribal marriages) discussed in paragraph 8.11 would however, apply to such an action, surmountable except by the de facto (or tribal) spouse who would at present be unable to claim.

8.24 The estate of the deceased worker would also be able to claim, on the basis of a breach of statutory duty, for resultant loss of earnings and medical expenses incurred between the contraction of the disease and death, though here also de facto relationships (or tribal marriages) would present problems under current law.

BREACH OF STATUTORY DUTY ACTIONS BY RESIDENTS OF BARYULGIL SQUARE AND DEPENDANTS OF DECEASED RESIDENTS[10]

8.25 The *Clean Air Act* 1961 (N.S.W.) and the *Clean Waters Act* 1970 (N.S.W.) imposed obligations on Asbestos Mines Pty Ltd to refrain from pollution of the air or the waters. However, there may be some doubt whether these Acts give any private right of action to persons injured by their breach. For that reason, success in actions by residents of the neighbouring area arguing that the pollution caused their contraction of an asbestos-related disease cannot be presented as a strong possibility, though it is not out of the question.

8.26 The sections which, on the evidence in Chapter 6, appear to have been breached are Sections 10 and 11, 14, 15(2) and 19(2) of the *Clean Air Act* 1961, and Section 16 of the *Clean Waters Act* 1970.

8.27 Sections 10 and 11 of the *Clean Air Act* require Scheduled Premises to be licensed. Those provisions applied to Asbestos Mines Pty Ltd after 1 August 1976 and the evidence in paragraphs 6.65 to 6.70 and in Appendix III, paragraphs 2.57 to 2.58 makes it clear that Asbestos Mines Pty Ltd were in breach of those provisions for (as yet unclarified) periods between 1 August 1976 and 24 April 1979. However, it could not be shown that it was this breach — failure to hold a licence — that caused contraction of an asbestos-related disease by atmospheric pollution, and therefore, even if the Act were held to give private rights of action, a claim based on Sections 10 and 11 would fail.

8.28 Sections 14, 15(2) and 19(2) require the occupier of Scheduled Premises (Sections 14 and 15(2)) and unscheduled premises (Section 19(2)) to prevent or minimise air pollution. Prior to 11 January 1963 Asbestos Mines Pty Ltd were unscheduled premises; after that date they came within the Schedule. The evidence suggests that throughout the period from passage of the act in 1961 to closure of the mine in 1979, they failed to minimise, let alone prevent, air pollution. Thus, a breach could probably be proved. The case of *Joosten* v *Midalco Pty Ltd*, discussed in Appendix III paragraphs 1.65 to 1.67 and 4.8, shows that courts will accept that atmospheric pollution by airborne fibre can cause asbestos-related disease. Furthermore, the sections can be taken to have intended to protect persons in areas around industrial enterprises from disease and inconvenience resulting from pollution. Therefore, residents of Baryulgil Square probably have a good chance of success in actions based on Sections 14, 15(2) and 19(2) *if* they have an asbestos-related disease and *if* the Act is held to give private rights of action.

8.29 Section 16 of the *Clean Waters Act* 1970 may also be held not to give a private right of action. In the event that such a right were upheld, the evidence suggests that a breach could probably be proved. However, it is unlikely that residents with an asbestos-related disease could prove that the breach caused their injury, since medical opinion doubts the contraction of such a disease through ingestion, as opposed to inhalation, of asbestos fibres. An action based on Section 16 of the *Clean Waters Act* 1970 would therefore be unlikely to succeed.

8.30 Actions by dependants of Baryulgil Square residents who died as a result of asbestos-related disease could be brought under the *Compensation to Relatives Act* 1897 and the *Law Reform (Miscellaneous Provisions) Act* 1944. Actions based on Sections 14, 15(2) and 19(2) of the *Clean Air Act* would have a good chance of success — subject to

the court's finding of a private right of action, to the establishment that death resulted from an asbestos-related disease, and to the difficulties associated with de facto relationships (and tribal marriages).

CLAIMS UNDER THE *WORKERS' COMPENSATION (DUST DISEASES) ACT*[11]

8.31 The *Workers' Compensation (Dust Diseases) Act* 1942 (N.S.W. provides a statutory compensation scheme for persons disabled by a scheduled dust disease — which now includes asbestosis, mesothelioma and bronchogenic carcinoma — and their dependants.

8.32 Where a worker contracts a scheduled dust disease as a result of employment he or she is entitled to apply to the Dust Diseases Board for compensation. The worker will be examined by the Board's Medical Authority, who determine whether he or she has a scheduled disease and the extent of the resultant disability. Where the disease and disability — which means incapacity to work — is certified, the worker is entitled to receive weekly compensation payments from the Board (indexed twice yearly) or, if the Board so determines, a lump sum in redemption of the rights to weekly payments. In the event of the death of a worker as a result of a dust disease, or a worker who was suffering a dust disease, the widow or widower (which includes a de facto spouse) and children are entitled to weekly payments and/or a lump sum in compensation for their loss of support.

8.33 Baryulgil workers suffering asbestos-related diseases, and the dependants of deceased Baryulgil workers who had such diseases, are entitled to seek compensation from the Board. The only barrier to success in such claims is the allegedly conservative diagnostic criteria adopted by the Medical Authority. However, no evidence has been put before the Committee which substantiates the suggestion that the Dust Diseases Board adopts an unduly conservative approach to diagnosis, and, in the absence of such evidence, the Committee must conclude that the *Workers' Compensation (Dust Diseases) Act* provides a fruitful avenue of compensation for Baryulgil workers suffering such a disease and for their dependants.

ACTIONS BY RESIDENTS OF BARYULGIL SQUARE AGAINST ASBESTOS MINES PTY LTD FOR NEGLIGENCE[12]

8.34 The law of negligence requires that one must take reasonable care to avoid actions which one might reasonably foresee would be likely to cause injury to one's neighbours — that is, to persons foreseeably affected by one's acts. Occupiers of industrial premises ought reasonably to have foreseen that residents of neighbouring areas might contract diseases as a result of atmospheric pollution by substances such as asbestos fibre, once the medical connection between exposure to small quantities of the fibre and contraction of the disease had become generally known within their industry. Therefore by the mid or late 1960s Asbestos Mines Pty Ltd had a duty to take reasonable care to avoid exposing the residents of neighbouring areas to the danger of contracting mesothelioma from pollution emanating from the mine site.

8.35 The matters which residents of Baryulgil Square would need to establish to claim damages from Asbestos Mines Pty Ltd for asbestos-related disease are very similar to those discussed in paragraph 8.3 — that some act of Asbestos Mines Pty Ltd resulted in the pollution and that, but for that pollution, they would not have contracted the disease; that it was foreseeable to Asbestos Mines Pty Ltd that the pollution they caused or permitted might result in asbestos-related disease in persons living nearby; that there were practicable precautions available whereby Asbestos Mines Pty Ltd could probably have prevented the pollution, and that a reasonable mine and mill operator would have taken

those precautions. It appears that residents of Baryulgil Square suffering an asbestos-related disease, contracted between the mid-1960s and 1979 would have little difficulty establishing these matters, but that they would be unable to prove foreseeability if the disease was contracted before the mid 1960s. Even where the disease was contracted after that date, residents of the Square who succeeded in their action might have their damages reduced on the grounds that their residence at the Square after the period from 1977 to 1980 amounted to contributory negligence. If the disease was contracted after the closure of the mine in 1979, residents might also have difficulties in establishing that there were practicable precautions available since the financial position of Asbestos Mines Pty Ltd would have prevented them from taking more extensive measures to seal the tailings dump.

ACTIONS BY RESIDENTS FOR NUISANCE[13]

8.36 Two types of nuisance actions exist — the action for damages (or injunction) for private nuisance and the action for damages (or injunction) for public nuisance. Private nuisance arises where a person performs an act which substantially and unreasonably interferes with another person's beneficial use of his or her land. The disturbance must be a foreseeable result of the act which causes the interference. To be entitled to sue for damages for private nuisance or to seek an injunction against its continuance, the plaintiff must be the possessor of the land, either as owner or lessee.

8.37 The emission by Asbestos Mines Pty Ltd of dangerous quantities of airborne asbestos fibre onto the land of Baryulgil Square would probably qualify as substantial and unreasonable interference. However since the injury which such interference could cause would be the contraction of mesothelioma, a resident of the Square who had contracted that disease could not claim damages if the emission producing the disease occurred before the mid 1960s, since it was not until after that date that contraction of the disease was foreseeable. However, foreseeability could be established in relation to mesothelioma contracted as a result of emission occurring after the mid, or at least late, 1960s.

8.38 Until 1980, residents of the Square were not possessors of the land because they held no lease. Therefore no actions for private nuisance could be brought by residents of the Square on the grounds of disease contracted as a result of pre 1980 emissions. In 1980 the Baryulgil Square Co-operative Ltd became lessee of the land and members of the Co-operative would therefore have standing to bring private nuisance actions on the basis of mesothelioma contracted as a result of post 1980 emission. Since the mine and mill ceased operation in 1979, any post 1980 emission would be the result of asbestos fibres being windcarried from the tailings dump.

8.39 It is unlikely that any private nuisance action could be based on the pollution of the waters of Baryulgil Sqaure as a result of run-off from the tailings dump. Since medical opinion does not accept that asbestos-related disease can be caused by ingestion of fibre, this pollution would probably not be found to amount to substantial and unreasonable interference nor to have caused the disease for which damages would be sought.

8.40 Since actions could only be brought for disease contracted after 1980, the long latency period of mesothelioma means that damages actions based on such disease would not be brought for at least a decade. However, members of the Baryulgil Square Co-operative would have standing to seek an injunction against any continued pollution of the Square by airborne fibre from the tailings dump. However, such an injunction would be unlikely to be granted because the financial position of Asbestos Mines Pty Ltd would make it impossible for them to undertake the rehabilitation of the mine site necessary to prevent further pollution and thereby comply with the injunction.

8.41 An actionable public nuisance is an act causing inconvenience or damage to particular members of the public in exercising their rights, greater than the incovenience or damage caused to the public as a whole. If residents of Baryulgil Square had contracted an asbestos-related disease as a result of air pollution emanating from the mine, this would clearly amount to the necessary particular damage. The interference with their rights would have, as required, been unreasonable and substantial. The plaintiff in a public nuisance action need not show any possessory rights to have standing, and thus residents of the Square could bring actions for damages for public nuisance against Asbestos Mines Pty Ltd for asbestos-related disease contracted as a result of air pollution after the mid- to late 1960s. They would be unlikely to be granted an injunction against a continuation of the public nuisance because of the impossibility of compliance.

ACTIONS FOR DAMAGES BY RESIDENTS BASED ON THE RULE IN *RYLANDS* v *FLETCHER*[14]

8.42 If a person brings onto his or land a thing likely to cause damage if it escapes from the land, he or she is liable in damages to the occupiers of adjoining land for any loss caused if escape occurs. However, if the bringing of the thing on to the land is in the course of natural use of the land there is no liability.

8.43 Residents of Baryulgil Sqaure would not be able to bring actions in damages against Asbestos Mines Pty Ltd for disease caused by the escape of asbestos fibre from the mine site. First, the fibre was not brought onto the site but naturally occurred there. Second, the mining and milling of asbestos and the collection of the residue in tailings dumps would be natural use of the mining lease.

ACTIONS FOR DAMAGES BY RESIDENTS OF BARYULGIL SQUARE FOR TRESPASS TO THE PERSON[15]

8.44 Trespass to the person, or 'battery', is the intentional bringing about of a harmful or offensive contact with the person of another. The inhalation of asbestos fibre by residents of Baryulgil Square would be harmful contact, but it could not be established that such contact was *intentionally* brought about by Asbestos Mines Pty Ltd, even though they may have foreseen that the contact would take place and taken no steps, or inadequate steps to prevent it. Furthermore, to constitute battery, the contact must be direct and not consequential, and, in the case of the residents, inhalation of the fibre would be merely the consequential outcome of the operation of the mine and mill or of the existence of the tailings dump. Therefore, actions for battery by residents would not succeed.

ACTIONS FOR DAMAGES BY RESIDENTS FOR TRESPASS TO LAND[16]

8.45 Trespass to land consists in the direct and intentional invasion of the land of another by some object, animate or inanimate. However, residents of Baryulgil Square could not sue for trespass to land on the grounds of 'invasion' of the Sqaure by airborne asbestos fibre. First, until 1980 they would not have had standing since they had not title to the land as owners or lessees. Even though the Co-operative became lessee in 1980, such an action would still have no chance of success, since the 'invasion' of the land by the fibres was (or is) not an intentional act of Asbestos Mines Pty Ltd. Moreover it could only be a direct invasion of the Square if it was carried there over an area where the property of Asbestos Mines Pty Ltd and the land of the Square were contiguous.

ACTIONS BY WORKERS OR RESIDENTS IN NEGLIGENCE AGAINST PUBLIC BODIES[17]

8.46 Persons injured by the negligence of public bodies in carrying out their duties may sometimes sue the Crown for any loss resulting from that negligence. It would appear that the actions of a number of public bodies concerned with Baryulgil were unwise or careless and that such carelessness contributed to the exposure of members of the Baryulgil community to the inhalation of asbestos fibre. However, the courts do not always hold carelessness by public bodies to be a breach of duty of care. Two factors limit such a finding. First the courts will (generally) only find a breach of duty where the public body has performed an act carelessly (misfeasance) rather than where it has carelessly failed to do an act (non-feasance). Second, they will not impose a duty of care on public bodies where their acts are discretionary or proceed on policy considerations.

8.47 The public bodies whose activities could be said, on the evidence, to have contributed to the health hazard at Baryulgil are the Mines Inspectorate, the Division of Occupational Health, the Department of Education, the State Pollution Control Commission and the Copmanhurst Shire Council. However, in most cases, ther activities would be classified either as non-feasance or as the exercise of discretion or as both. For example, the failure of the Mines Inspectorate to prosecute for breach of General Rule 65B of the *Mines Inspection Act* 1901 (N.S.W.) and the failure of the State Pollution Control Commission to enforce the licensing provisions of the *Clean Air Act* 1961 (N.S.W.) are both instances of non-feasance and would both almost certainly be held to be matters of discretion.

8.48 The only likely instance of alleged carelessness by the Mines Inspectorate that would not be a policy matter and could be classified as misfeasance would be failure to notice that the mine had been cleaned up for inspections. If a duty of care was upheld in this case, the elements establishing breach would have to be made out. These are the same elements of negligence discussed in paragraph 8.3 and 8.35 — causation, foreseeability, availability of practicable precautions, and departure from the standard of the 'reasonable man'. If a duty of care were accepted in this instance, a former worker suing the Mines Inspectorate for damages for an asbestos-related disease could establish those elements with little difficulty.

8.49 The same facts could possibly establish a duty of care in the case of the Division of Occupational Health, though this is less likely since theirs was a monitoring and not enforcing role.

8.50 It is very unlikely that a duty of care would be found in the case of the Department of Education in relation to its actions regarding tailings in the school yard, because of the non-feasance and discretion hurdles.

8.51 The activities of the State Pollution Control Commission amount to an almost classic case of non-feasance since they did virtually nothing in relation to the mine and mill and nothing after March 1980 in relation to the school. Even if the courts could interpret their failure to act as careless action — for example by presenting their failure to attach conditions to the licence under the *Clean Air Act* 1961 (whenever that licence was issued) as a careless and improper issue of the licence — the matters would almost certainly be found to involve questions of discretion. Thus, negligence actions against the State Pollution Control Commission would be unlikely to succeed.

8.52 An allegation that the Copmanhurst Shire Council was negligent in using asbestos tailings as road surfacing material would be able to surmount the non-feasance hurdle as this could fairly easily be presented as misfeasance. However it might be held to involve the exercise of discretion. Even if a duty of care were upheld, there would be great difficulty in showing that disease resulting from that act was a foreseeable consequence of

use of tailings before the mid- to late 1960s. Therefore an action against the Council could only succeed if it related to mesothelioma contracted after that period. Such instances of disease are unlikely to be diagnosed for about a decade. If, however, they do occur in the future, the sufferers would be able to establish the other elements of the claim.

8.53 Dependants of residents, who would have had actions for negligence or for private or public nuisance against Asbestos Mines Pty Ltd or for negligence against a public body, and who dies as a result of a disease caused by such negligence or nuisance, could claim under the *Compensation to Relatives Act* 1897 and the *Law Reform (Miscellaneous Provisions) Act* 1944 in the manner set out in paragraphs 8.9 to 8.13.

THE FINAL TALLY

8.54 It would therefore seem that former workers suffering asbestos-related disease would have a good chance of succeeding against Asbestos Mines Pty Ltd in negligence actions and in actions for breach of statutory duty based on General Rule 65B of the *Mines Inspection Act* 1901 (N.S.W.), though the damages award might not be paid in full. They would also have some chance of success in actions of negligence against the Mines Inspectorate and the Division of Occupational Health. Their dependants would have equal chances of success providing the relationship was not through a de facto relationship or tribal marriage. Even if it were, the difficulties could be surmounted, except (perhaps ironically) by the dependent spouse (subject to the proposed N.S.W. legislation being given retrospective effect). Workers and their dependants would also have a good chance of compensation from the Dust Diseases Board.

8.55 Residents of the Square would have a good chance of success in actions for breach of S.15(2) of the *Clean Air Act* 1961, and in public nuisance actions based on diseases contracted after the mid 1960s. They would also have some chance of success in negligence actions based on diseases contracted after that date. The dependants of deceased residents would have the same chance of success as the deceased would have had, subject to questions concerning de facto relationships and tribal marriage. However, as all of these actions would be against Asbestos Mines Pty Ltd, the residents and their dependants might not have their awards of damages paid in full.

8.56 Former pupils at Baryulgil School would have some chance of success in an action for negligence against the Department of Education, providing their disease was contracted after the mid 1960s.

8.57 There is thus at least one possibly successful cause of action open to all of the various groups into which the community could be divided. And of course, only one success is needed — or possible. As soon as a person has succeeded in one cause of action, his or her receipt of damages will mean ther can be no loss remaining to be compensated in another action.[18] (Even though a *Workers' Compensation (Dust Diseases) Act* payment would not prevent a subsequent common law claim, the compensation received would be taken into account in assessing the damages).[19]

8.58 The two difficulties that stand out most starkly are the difficulty of getting an award against Asbestos Mines Pty Ltd paid in full, and the difficulty of bringing dependants' actions where the dependency relationship is based on a de facto relationship of a tribal marriage. These problems are addressed by the Committee in its suggestions in Chapter 9.[20]

ENDNOTES

1 See paragraph 1.4.
2 See paragraphs 1.2 to 1.15.
3 The lack of standing to sue for private nuisance and trespass to land of persons occupying land other than as owners or lessees is a particular problem faced by residents of Aboriginal reserves. See Appendix III, Chapter 14, paragraphs 4.21 to 4.27 and paragraph 4.67. The Committee's recommendation on this issue is in paragraph 12.
4 See Appendix III, Chapter 1, paragraphs 1.1 to 1.123.
5 See Appendix III, Chapter 1, paragraphs 1.124 to 1.161.
6 But note the intention of the New South Wales Government to introduce legislation to allow Compensation to Relatives actions by de facto spouses, reported in *Sydney Morning Herald*, 12 September 1984, p. 1.
7 Intended legislation relating to de facto spouses, referred to in note 6 above, will also, reportedly, give rights in an intestacy.
8 See Appendix III, Chapter 2, paragraphs 2.1 to 2.40.
9 See Appendix III, Chapter 2, paragraphs 2.72.
10 See Appendix III, Chapter 2, paragraphs 2.41 to 2.72.
11 See Appendix III, Chapter 3.
12 See Appendix III, Chapter 4, paragraphs 4.1 to 4.16.
13 See Appendix III, Chapter 4, paragraphs 4.19 to 4.43.
14 See Appendix III, Chapter 4, paragraphs 4.45 to 4.57.
15 See Appendix III, Chapter 4, paragraphs 4.59 to 4.62.
16 See Appendix III, Chapter 4, paragraphs 4.63 to 4.69.
17 See Appendix III, Chapter 5.
18 See Appendix III, Chapter 1, paragraphs 1.105 to 1.118.
19 See Appendix III, Chapter 3, paragraphs 3.16 to 3.20.
20 See paragraphs 9.19, 9.22 and 9.28 to 9.31.