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PNEUMOCONIOSIS IN NEW SOUTH WALES

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Although the subject of this paper is pneumoconiosis in New South Wales I should point out that most of my experience in this field has been with silicosis and asbestosis and that I intend to touch only briefly on those dust diseases other than silicosis.

You will no doubt be aware of the new Workers' Compensation (Dust Diseases) Act, 1942-1967 which will replace the existing Silicosis Act. Regulations are at present being framed for the new Act and it is intended that the new Act will cover, in addition to silicosis, asbestosis, talcosis, micatosis, siderosis, stannosis, aluminosis, berylliosis, hard metal pneumoconiosis, coal dust pneumoconiosis, byssinosis, bagassosis, and Farmer's lung.

The new Act is heavily slanted towards control of silica industries and a great deal of attention is paid to the control of asbestosis.

The Division of Occupational Health has carried out a number of surveys into the asbestos industries, the last being approximately ten years ago. A total of fifteen cases of asbestosis was found in the entire survey. Since that time approximately one new case per annum has been brought to the attention of the Division and during the period 1942-1966 there

have been three cases of silicosis complicated by ~~asbestosis~~ asbestosis compensated by the Silicosis Committee. Unfortunately at the time of death of all known asbestosis sufferers the deceased workers have not been subjected to post mortem examination, and no evidence has been obtained concerning the co-existence of carcinoma of the lung or mesothelioma. Certainly, no cases of mesothelioma have been reported to the Division of Occupational Health since this condition came into prominence*. In all, insufficient cases of asbestosis have been noted to make a statistical survey worthwhile.

Minor surveys into the use of talc in the rubber and cosmetic industries have turned up only one case of talcosis and similar minor surveys of the use of mica dust in the manufacture of electrical components and damp-proof coursing have failed to reveal any micatosis.

Cases of siderosis are seen from time to time in welders and boilermakers but disability has occurred only when the exposure to iron-dust or fume has been accompanied by exposure to silica dust. No cases of aluminosis, berylliosis, stannosis, or hard metal pneumoconiosis have been seen. It is possible that some cases may have been compensated without coming to the attention of the Division.

In regard to byssinosis, New South Wales is progressing rapidly in the production of cotton and very high levels of cotton dust have been recorded. The accepted concentration for cotton dust in carding processes is 2.5 mg/cubic metre and in other processes 1.0 mg/cubic metre. In New South Wales, ginning is carried out for approximately twelve weeks each year and levels of 5.0 mg/cubic metre have been found. However, it is in the delinting process that hazardous conditions have been found, as delinting is carried out for six months of the year and average concentrations have been found to be 17-25 mg/cubic metre. The highest recorded figure was 27 mg/cubic metre. Whilst no cases of byssinosis have yet come to my attention in this State it is feared that unless drastic control measures are implemented, and soon, byssinosis will become an established disease.

No cases of Farmer's lung have been seen at the Division but advice has been sought from time to time by physicians in some of the chest clinics of the larger hospitals concerning the aetiology and the treatment of this condition.

As a Medical Officer of the Division of Occupational Health has carried out the medical examinations of all applicants

* Three cases of mesothelioma of the pleura with an associated asbestos exposure have been notified since the Conference.

for compensation for silicosis for about two decades, an excellent liaison has always existed between the Silicosis Committee and the Division. Whenever doubt has arisen as to the hazardous nature of an applicant's occupation, the scientific officers from the Division have been able to give guidance except in those cases where the process has been abandoned or significantly altered. Thus many dusty situations have been evaluated and the continuing effects of dust control measures can be compared with the effects of the working environment upon the worker.

There have been three schemes either directly or indirectly relating to the compensation of workers in silica industries. The No. 1 Scheme of the Workers' Compensation Silicosis Act of 1920 embraced all workers in sandstone industries in the county of Cumberland. This was not a scheme for compensation in itself but permitted the Minister to make schemes. It was later extended to Northumberland and certain other areas.

Number 2 Scheme of this Act was an extension to cover the metal trades and included glass workers, refractory workers, ore millers and sand blasters but excluded dressers, moulders, foundry labourers, metal miners, brick workers and pottery workers. This scheme allowed for compensation totalling £1,000 in a lifetime, and survivors of this early scheme were "picked up" by the 1942 Act.

The Workers' Compensation (Silicosis) Act, 1942 allowed for the compensation of all workers in New South Wales in silica industries but excepted workers in Broken Hill, coal mines and shale mines. The No. 1 Scheme was implemented in 1927 and the No. 2 in 1938. They ceased to operate on the 30th June, 1942.

The Extent of the Silicosis Problem

Table 1

	Applications	Awards
No. 1 Scheme	766	245
No. 2 Scheme	19	7
Act	8,602	1,772

Table 1 indicates the total number of applications for compensation and the total awards made under the Schemes and the Act.

One hundred and seventy workers diagnosed as having silicosis have not as yet suffered any reduction in earning capacity and awards have therefore not been made in their favour. They are not included as beneficiaries in the above table.

Three hundred and ninety five workers (to 30.6.66) certified by the Silicosis Medical Authority to be disabled for work in varying degrees by silicosis continued to work.

The Incidence of Silicosis in Various Occupations

The applications for compensation and awards made in respect of disablement during the year 1st July, 1965 to 30th June, 1966, is typical of most years.

The Increasing Life Span of Silicosis Sufferers

When a silicotic worker dies the Silicosis Medical Authority is required to issue a certificate as to the cause of his death for purposes of compensation. Generally speaking, death is certified as not due to silicosis if the registered Death Certificate states that the cause of death was an accident, or some acute medical emergency such as a coronary infarct, cerebral haemorrhage or cancer of the bowel. In those cases where it could be said with some degree of certainty that the condition of silicosis would have been expected to so contribute to pulmonary or cardio-pulmonary embarrassment as to accelerate dying, such as in cor pulmonale or pneumonia, death is certified as having been due to silicosis. As can be imagined, decisions of this nature are sometimes quite difficult.

Up to the 30th June, 1966, 1,199 disabled workers died, and of these death was certified as due to silicosis in slightly less than 50 per cent. Approximately 5 per cent of all these deaths were accidental.

The Australian life table produced by the Commonwealth Actuary and the Commonwealth Statistician on the 30th June, 1961 and published in 1965, stated that on entering industry at the age of fifteen, the life expectancy of a male would be 55.07 years, giving a total life span of 70.07 years. When such a worker has reached the age of 66, in the absence of any serious pathology, he would have a life expectancy of a further 11.9 years.

The average ages and age groups of the 1,199 disabled workers at the date of death is set out in Table 3 for each class of employment.

It can be seen that from the years 1942 to 1966 the average life span of the silicosis sufferer has been slightly less than his estimated life expectancy when he entered industry at the age of fifteen. Stonemasons (72.1 years), coal lumpers (74.0 years), gas manufacturers (75.0 years) each exceeded their early life expectancy, whereas certain groups such as furnace bricklayers (53.8 years) fared considerably worse.

The average age at death of disabled workers who died in each of the years 1960 to 1966 gives a more heartening picture as seen in Table 4.

Table 2

Industry	Applicants	Awards
Sandstone industry -		
Stonemasons	17	3
Quarrymen	5	2
Rockchoppers and sandstone miners	16	4
	38	9
Metal trades -		
Abrasive blasters	1	1
Dressers	15	1
Foundry labourers	30	4
Furnace bricklayers	10	5
Moulders	148	13
Others	70	7
	274	31
Abrasive manufacturing		
Asphalt manufacturing		
Brickmaking	72	15
Electricity production	8	1
Gas manufacturing	4	-
Gelatine manufacture.(diatomaceous earth mixing)	1	1
Glass making	5	2
Grain elevating	-	-
Metal mining	14	6
Ore milling	10	4
Paint manufacturing	7	-
Pottery and tile making	2	2
Refractory materials	80	5
Rubber manufacturing	2	-
Shipping	1	-
Mixed dusts -		
Metal mining and metal trades	6	-
Metal mining and sandstone	10	0
Metal trades and sandstone	3	-
Other mixed dusts	1	1
	20	1
Totals	538	77

Table 3

Industry	Average age at date of death	Under 30	31-40	41-50	51-60	61-70	71-80	81-90	Total deaths under Act
Sandstone industry -									
Stonemasons	72.1	..	..	..	11	46	55	19	131
Quarrymen	67.1	..	..	5	9	25	16	4	59
Rockchoppers, sandstone miners	66.9	..	2	7	41	93	70	13	226
									416
Metal trades -									
Abrasive blasters	60.2	..	..	4	4	8	5	..	21
Dressers	61.9	..	..	8	10	23	10	1	52
Foundry labourers	65.6	..	..	..	9	16	6	1	32
Furnace bricklayers	53.8	..	..	2	1	2	1	1	7
Moulders	65.8	..	3	5	23	38	26	3	98
Others	61.5	..	..	2	10	12	5	2	31
									241
Abrasives manufacturing	60.7	..	..	..	2	2	..	..	4
Asbestos manufacturing	58.5	..	..	..	2	..	..	..	2
Biograph operating	54.0	..	..	..	1	..	..	..	1
Brickmaking	65.6	..	2	1	14	27	24	..	68
Coal lumping	74.0	..	..	..	..	..	1	..	1
Gas manufacturing	75.0	..	..	..	..	1	1	..	2
Glass making	63.0	..	..	1	1	1	1	..	4
Grain elevating	68.0	..	..	..	..	1	..	..	1
Metal mining	67.3	..	..	8	21	53	57	3	142
Ore milling	58.8	..	..	3	6	4	2	..	15
Paint manufacturing	67.0	..	..	..	..	1	..	..	1
Pottery, tile making	62.6	..	..	5	1	6	5	..	17
Refractory materials	61.1	..	..	2	9	11	6	..	28
Rubber extruding	68.0	..	..	..	..	1	..	..	1
Woodbending	57.0	..	..	..	1	..	..	..	1
Mixed dusts -									
Metal mining and sandstone	68.9	..	..	5	21	71	50	15	162
Other mixed dusts	65.8	..	..	3	18	42	23	6	92
									254
Totals	66.8	..	7	61	207	453	340	59	1,199

Table 4

Year	Number of deaths	Average age at death
1960 - 61	64	70.1 years
1961 - 62	72	68.9 years
1962 - 63	66	70.0 years
1963 - 64	60	69.1 years
1964 - 65	63	71.8 years
1965 - 66	72	70.1 years

A more or less steady increase in the life expectancy of silica workers in various classes of employment can be seen in Table 5 which gives the average age of death of all workers who died up to and including the date specified.

Table 5

Occupation	Average age at time of death all workers					Number of cases	Increase in years
	1946	1950	1956	1961	1966		
Stonemasons	65.8	66.8	69.2	71.3	72.1	131	6.3
Rockchoppers and sandstone miners	61.3	61.9	63.3	64.8	66.9	226	5.6
Quarrymen	63.1	65.0	65.6	65.7	67.1	59	4.0
Abrasive blasters	63.6	55.2	57.6	57.4	60.2	21	Decrease 3.4
Dressers	55.5	53.7	57.5	61.2	61.9	52	6.4
Moulders	67.0	57.2	59.5	61.8	65.8	98	Decrease 1.2
Foundry labourers	60.0	58.5	60.9	63.3	65.6	32	5.6
Metal miners	64.1	63.8	64.5	66.8	67.3	142	3.2
Ore millers	-	48.0	54.0	58.5	58.8	15	10.8
Refractory workers	-	57.5	58.6	60.1	61.1	28	3.6
Brickmakers	-	54.4	58.8	64.1	65.6	68	1.2
Tile & pottery ceramic workers	55.5	66.5	56.5	62.4	62.6	17	7.1

The Increasing Working Span of Workers in Silica Industries

Due to a number of factors, not the least of which being adequate dust control, workers in most of the main silica industries can expect to work longer in their chosen occupation than they could twenty years ago. The following table indicates the average age at which workers in various occupations were first found to have contracted a disabling degree of silicosis.

Table 6

Occupation	Average age of commencing compensation				
	1942	1950	1956	1961	1966
Stonemasons	59.6	61.6	63.9	64.2	64.3
Quarrymen	58.4	54.8	58.7	59.1	59.8
Rockchoppers and sandstone miners	54.1	55.8	56.7	58.6	59.2
Abrasive blasters	44.6	53.7	50.3	60.7	59.1
Dressers	-	49.1	50.8	53.3	55.5
Moulders	-	45.6	48.4	53.5	58.5
Foundry labourers	-	53.6	55.0	59.8	60.7
Metal miners	-	54.7	56.7	58.7	59.7
Ore millers	40.5	47.9	49.8	50.4	52.4
Refractory material	54.5	47.6	50.2	51.1	50.7
Brickmaking	-	54.0	55.2	55.9	55.9
Pottery and tilemaking	-	52.9	54.0	54.8	55.8
Abrasive manufacturing	-	54.0	55.0	56.3	56.3

It can be seen from this table that in some occupations the useful working life has been only slightly increased, but it must be remembered that many of these workers may have developed silicosis before adequate control measures were instituted. Nevertheless, it is a sobering thought that in so many occupations workers fail to reach retiring age prior to developing a disabling incapacity.

The average age at which a disabling incapacity due to silicosis was developed (for all workers up to and including the date shown) can be seen in Table 7.

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Table 7

Year	Total number of cases	Age disability commenced in years
1945 - 46	376	53.7
1950 - 51	647	54.5
1955 - 56	890	55.9
1960 - 61	1,314	58.3
1965 - 66	1,675	58.2

The age distribution of the onset of disabling silicosis up to, and including each of the years 1942, 1946, 1956 and 1966 can be seen in Figure 1.

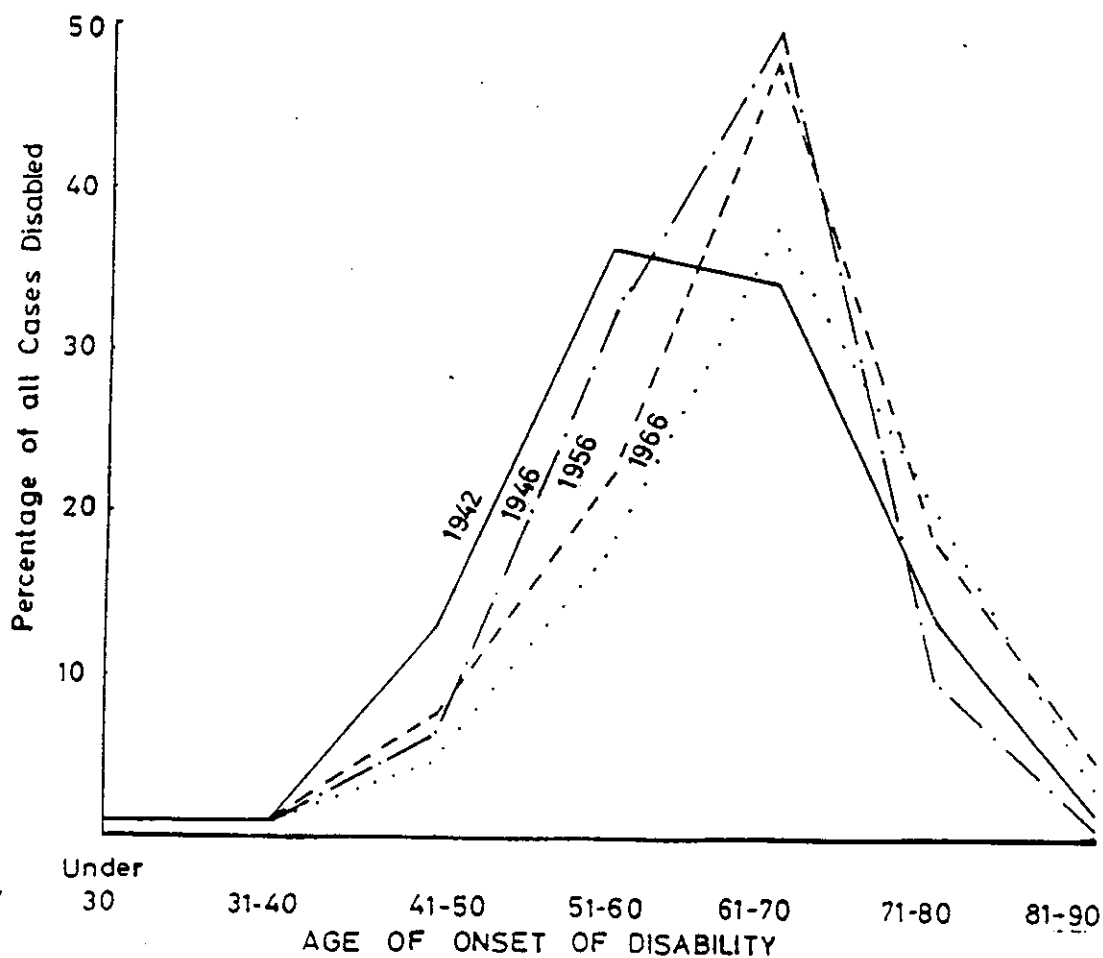


FIGURE 1

Generally, most cases of disablement occurred in the 61-70 age group, but a gradual shift to the higher age groups can be seen.

Relationship of Silicosis and Tuberculosis

Most statistics have been produced since 1956, up to which time 981 workers have been awarded compensation for silicosis. Of these, 467 were thought to have uncomplicated silicosis, whilst 514 had symptoms and x-ray appearances which were thought to be due to a complicating pulmonary tuberculosis.

All workers with suspected tuberculosis are referred to their private doctor with a request to be sent to a pulmonary clinic.

The New South Wales Tuberculosis Division has been co-operating with the Occupational Health Division during surveys by taking chest x-rays of workers at their place of employment as workers in silica industries are considered to be at special risk.

Degree of Disability

As at the 30th June, 1966, a total of 785 workers were on the Silicosis Fund. Of these 431 had a total disability award, and 354 a partial award.

Past and Present Records for the Development of Disabling Silicosis

The shortest period of exposure recorded in New South Wales for the development of total disability was six months. This was due to work in a confined space excavating in sandstone beneath one of the larger city buildings in conditions of appalling ventilation. In more recent years a worker employed in an ore milling establishment developed a major disability after 18 months of employment as an ore miller, during which time he milled silica intermittently.

Lack of Correlation Between X-ray Findings and Disability

The medical examination in the past has consisted of a thorough medical and industrial history, a clinical examination and a 17" film chest x-ray. No pulmonary function tests have been carried out as a routine but in the future it is intended that such tests will be introduced for all new cases with a disability.

The fallibility of x-ray findings taken as a guide to the degree of disability was shown some years ago when a worker with marked nodulation was awarded a 50 per cent disability and shortly after ran second in the 100 mile Goulburn-to-Sydney Bicycle Race.

Another surprising case was that of an 82 years old stonemason making his first appearance for a medical examination, more as a "check up" than for purposes of obtaining compensation. When asked whether he had any breathlessness, this fine old man said that he did get breathless when riding his bicycle five miles to work when going up a half mile hill. Although one of the fittest 80 years old men I have ever seen, this man had marked nodular fibrosis in every inch of his lung fields.

Moulding and Silicosis

A large percentage of moulders who have been disabled by silicosis worked in a special hazard in the bath and stove moulding processes at a time when silica flour was used as a parting powder. Since the use of this material was banned, the working conditions in most foundries have been such that the dust counts have usually been well below the recommended level.

Xerograph Operation and Silicosis

A possibly unsuspected hazard may exist in the operation of xerograph machines. Whilst most offset powders are silica free, others have been supplied from time to time which have a silica content of more than 50 per cent. Dust counts carried out during xerograph operations have indicated that a hazard could exist if such siliceous offset powders are used continuously for long periods. For this reason, the New South Wales Government Stores Department now specifies non-siliceous compounds.

The Value of Recommended Dust Levels in Controlling Silicosis

There is little doubt in my mind that even if the recommended values for various dusts are not exceeded cases of silicosis will occur from time to time when workers are exposed to the lower levels for long periods of time. In my opinion, this points to the necessity for always aiming for control to keep the dust levels well below the maximum allowable.

To Compensate or Not to Compensate

This is often a vexing question. One patient may have a long history of exposure to high concentrations of silica dust and marked radiological evidence of silicosis and yet complain of no significant disability. Another patient may have a short history of exposure to silica dust and minimal radiological evidence of the disease, and yet complain of severe disability in the absence of marked cardiac or other pathology.

The opinions of the Medical Board and the compensating authority may come into conflict as to which constitutes the most deserving case for compensation. The compensating authority would probably take the view that compensation should be based on

the degree of disability. The medical authority might take the opposite view, that the disease in itself is a disability as it should be regarded as evidence that the patient must never again work in a job which exposes him to silica dust and hence interferes with his livelihood. In New South Wales the degree of disability assessed by the medical authority may influence compensation payments to dependants in the event of the worker's death.

It is sometimes difficult to understand why one young and otherwise healthy worker will suffer rapidly increasing respiratory disability and die at an early age from cor pulmonale, whilst another worker such as our 80 years old stonemason will live his life with no apparent disability at all. One may well ask whether uncomplicated silicosis is a disability and whether all observed disabilities are due to concurrent diseases such as chronic bronchitis and emphysema. Certainly there is both clinical and radiological evidence of moderate to severe pulmonary emphysema in most workers who have severe respiratory disability, and little or no clinical or radiological evidence of emphysema in those who complain of no significant disability even though the degree of nodulation is severe. In some cases, serial x-rays taken over the years tend to show a diminishing degree of nodulation due to the progressive nature of emphysema. Whilst the disability increases, it is not unusual to find radiological evidence of silicosis diminishing, and one wonders whether some cases denied compensation on radiological evidence are not, in fact, unjustly overlooked. As there is no compulsion to obtain post mortem evidence of silicosis at the time of death and as very few deceased workers come to autopsy, it is difficult to answer this question.