

REPORT
ON
THE QUEENSLAND COAL BOARD
COAL MINERS' HEALTH SCHEME

* * *

**Chest X-Ray and Emphysema Check Survey
of Colliery Employees in Queensland**

by

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MAY, 1984

THE QUEENSLAND COAL BOARD
G.P.O. BOX 384
BRISBANE. 4001. Q.



FOREWORD

The Queensland Coal Board decided to take responsibility for development of a Coal Miners' Health Scheme and two Orders made by the Board on 8th December, 1982, and subsequently published in the Queensland Government Gazette formally established that Scheme.

One of these Orders set up a programme to Survey by Chest X-ray and lung function test all colliery employees in the State, and the second Order required new entrants to meet a pre-entry medical standard.

It is the first of these Orders with which this Report is concerned and a copy of that Order and its rescission are included.

The objectives of the Survey were primarily to identify the incidence and severity of lung disorders which may be related to coal mining and to seek recommendations for future direction.

In setting up the Survey the views and co-operation of the Queensland Coal Association, the Combined Mining Unions, and individual colliery managements were sought and it is pleasing to record that the degree of co-operation was outstanding.

Some 7 784 employees together with 123 retired employees were examined. The bulk of these were looked after by a mobile clinic, supplied and manned by the Queensland Department of Health, which visited 33 mine sites and 6 towns. The Medical Consultants to the Board identified 499 cases of abnormality and appropriate action was taken in each of these cases. Of these, 102 received a more complete follow-up. Pneumoconiosis and suspect pneumoconiosis cases totalled 75.

The setting up of the clinic at each site, together with the rostering and processing of employees, required a high order of organisation. This was made possible through the co-operation afforded by mine management and employees with the Board's officers and the staff of the mobile clinic.

The Queensland Coal Board is most grateful to the Department of Health for its logistic support and the Workers' Compensation Board of Queensland for its financial contribution towards the cost of the Survey.

The advice and efforts of its Medical Consultants, Dr. E.M. Rathus and Dr. E.W. Abrahams, have contributed significantly to its success.

In due course the Board will seek comment on this Report and its recommendations.

THE QUEENSLAND COAL BOARD

The Chairman,
The Queensland Coal Board,
G.P.O. Box 384,
BRISBANE. Q. 4001.

Dear Sir,

We have the honour to present to you our report on the findings of the Chest X-ray Survey of coal miners carried out under the Coal Miners' Health Scheme, published in the Queensland Government Gazette dated December 11, 1982, Vol. CCLXXI, No. 81, pages 1676-1677, under the authority of the Order vested in The Queensland Coal Board under the Coal Industry (Control) Act 1948-1978.

The Orders make provisions "for the compulsory medical examination of new entrants to the Coal Mining Industry and for the medical examination of employees of the Coal Industry under certain circumstances" and came into force from the first day of January, 1983.

This made it possible to Order a Chest X-ray Survey of miners and others presently employed in the Coal Industry.

In conjunction with the X-ray examination a check for Emphysema was carried out and a medical questionnaire was completed to provide basic data for supportive analysis and comment.

The Order relating to the X-ray Survey was rescinded by The Queensland Coal Board by notice in the Government Gazette dated April 21, 1984.

The Survey formally commenced on March 1, 1983 on the Ipswich coal fields where the first X-rays were taken, and continued until April, 1984, when all mines had participated as required.

The Survey was carried out by employees of the Department of Health under the auspices of the Director of Tuberculosis. We owe our thanks to this officer and the Chief Radiographer and the staff of the X-ray mobile unit for the continued excellence of the organisation of the Survey over this protracted period, and for co-ordination of visits amongst the scattered smaller mines.

We wish to record our appreciation of the technical advice and assistance given at all times by the Division of Health and Medical Physics.

We are also grateful to the staff of The Queensland Coal Board at all levels for their courteous and friendly help at all times in a programme which required constant adherence to detail and exact presentation of information.

ORGANISATION

The programme was organised by preliminary discussions between your Board, the Director of Tuberculosis, the Chief Radiographer and ourselves. Our intention was to notify every miner or other employee with an individual report on the X-ray, either normal or abnormal, and advised action as a consequence. Forms were designed for ease of recording and to facilitate communication of results to all concerned.

A facsimile of each of these forms is below.

1. Satisfactory Report (No significant abnormality noted)

"Dear Sir,

Your recent Chest X-ray is considered to be quite satisfactory. Your co-operation in this Survey of the health of Queensland coal miners is very much appreciated.

Yours faithfully,

MEDICAL ADVISER "

2. Abnormality Noted.

"Dear Sir,

An abnormality has been noted in your recent Chest X-ray and an interview will be arranged for you with the doctor whom you nominate, or whom you have already indicated on the questionnaire form.

You should not be concerned about this information as I will see that a full report is sent by the Department of Health to your doctor so that he can discuss the matter in detail with you.

2. Abnormality Noted (Contd)

Should you wish to be seen at the local hospital, the Medical Superintendent will receive a similar full report, and a suitable consultation will be arranged for you.

Your co-operation in this Survey of the health of Queensland coal miners is very much appreciated.

Please Note:- All future advice or action in this matter will be handled by:-

The Assistant Director (Chest Diseases),
Division of Environmental and Occupational Health,
Department of Health,
63-79 George Street,
BRISBANE. Q. 4000.

Yours faithfully,

MEDICAL ADVISER "

Form 2 above was circulated to the person concerned and the Director of Tuberculosis and a copy retained for the file. All abnormal X-ray films were sent to the Director of Tuberculosis for retention and usual action in the constant programme in this regard within the community, together with our comments on the accompanying copy of the questionnaire. This ensured efficient follow-up of important or suspect pathology.

A separate letter was sent to the person's nominated Doctor and this is reproduced below.

"Dear Doctor,

RE: COMPULSORY CHEST X-RAY - COAL MINERS' HEALTH SCHEME

Your patient has asked for any comments on his X-ray to be notified to you.

Enclosed please find copy of the questionnaire form and X-ray report.

A copy of this report and the Chest X-ray have been sent
to:-

The Assistant Director (Chest Diseases),
Division of Environmental and Occupational Health,
Department of Health,
63-79 George Street,
BRISBANE. Q. 4000.

All further correspondence on this matter should be referred
to the Assistant Director (Chest Diseases), who will be
communicating with your patient in any event on this basis
of the report received.

Yours faithfully,

MEDICAL ADVISER "

Our report on the X-ray was included in the questionnaire form
together with any clinical or advisory statements we cared to
make, so that the Doctor received the totality of information
available at the time.

The Questionnaire form consisted of a single folded sheet, and pages 1, 2, 3
and 4 are reproduced below to provide necessary information.

PAGE I

THE QUEENSLAND COAL BOARD

G.P.O. Box 384,
BRISBANE. Q. 4001.

X-RAY SURVEY QUESTIONNAIRE

Date.....

1. SURNAME..... Number.....
(Block Letters) (Office use only)

GIVEN NAMES.....

2. ADDRESS.....

3. AGE..... DATE OF BIRTH / / 19.

4. AGE AT ENTRY INTO COAL INDUSTRY.....

5. PRESENT CLASSIFICATION AND DURATION.....

.....

QUESTIONNAIRE FORM - PAGE I (Contd)

6. PAST CLASSIFICATION(S) AND DURATION.....
.....
7. OTHER DUSTY OCCUPATIONS - Mining
- Quarrying
- Foundryman.....
- Other
8. HAVE YOU BEEN A MINER IN THE UNITED KINGDOM? YES/NO
9. IF YES, HOW LONG?
10. HAVE YOU BEEN A MINER IN OTHER OVERSEAS COUNTRIES? YES/NO
11. IF YES, HOW LONG?
12. DO YOU FEEL GENERALLY FIT?
13. DO YOU SMOKE? YES/NO

PAGE 2

14. IF YES, HOW MUCH? (a) YEARS
(b) How many cigarettes
pipes
cigars
15. IF RETIRED, WHEN DID YOU RETIRE?19..
(To be answered only by those receiving compensation for "dust disease".)
16. WHEN WAS YOUR COMPENSATION GRANTED?19..
17. WHAT IS YOUR PRESENT STATE OF HEALTH?
GOOD.....
FAIR.....
POOR.....

N.B. (a) You will be advised of the result of your X-ray in due course.

(b) The answers to these questions are confidential

(c) Please enter the name and address of your own Doctor.

Doctor's Name:

Address:

.....

QUESTIONNAIRE FORM - PAGE 3

SPIROMETRY:

Age.....M/F HTcms (.....feetins)
WT kg (.....stonelbs)
Predicted (L) Observed (L)

Forced Exp. Vol. 1 sec FEV ₁ (L)		
Forced Vital Capacity FVC (L)		
Vital Capacity VC (L)		
FEV ₁ /VC %		

RESULT OF CHEST X-RAY

Normal ☐
Further Action ☐
.....
.....

PAGE 4

FACTS ABOUT THIS X-RAY SURVEY

The Queensland Coal Board is undertaking an industry Survey of both coal miners who are at present employed in and about coal mines in Queensland and those who have recently retired.

This Survey will essentially consist of a Chest X-ray and a test of lung function. The latter test is a simple "blowing" test and will be undertaken at the same time as the Chest X-ray. The intention is to obtain information on the present and past exposure of miners and associated workers to coal dust in the course of their work. The data will be used in future planning for health and safety in coal miners in Queensland.

In addition there will be an opportunity for retired miners to take advantage of the Survey and it is hoped that as many as possible will volunteer as this will give much valuable and necessary background information. All those

QUESTIONNAIRE FORM - PAGE 4 (Contd)

persons taking part in this Survey are asked to complete the questionnaire which will be handed to them prior to the X-ray. The questions asked are brief and direct, and require very little time and effort. Your co-operation in obtaining this data will be greatly appreciated.

As you will note on this questionnaire, all participants will be individually notified of their results, and a report sent to the Doctor of their choice where this is indicated.

The Survey is being carried out by the Department of Health under the auspices of the Director of Environmental and Occupational Health.

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Germane to this segment is the fact that we became aware of several short comings in the presentation of the questionnaire, and these are now discussed so that these omissions may be corrected in the event of such an exercise being undertaken in the future.

Title Page - Question 6

This should be more clearly expressed. Miners especially did not realise that it was necessary to clearly indicate all classifications and their duration, even when interrupted for periods of years.

For instance, a man may state he had entered the coal industry (Question 4) age 36, whereas in fact, he may have entered at age 15 to 26, and had another occupation intervening.

Title Page - Question 7.

Few men indicated complete detail, and particularly so in relation to time spent. The intention may have been implied but it must be spelt out.

Title Page - Question 13

Those who had given up smoking, often did not indicate their previous habit, which may have been significant.

Second Page - Question 17

Again, it may have been expected that miners and others would record significant illnesses, operations etc. but the omission remains.

SUGGESTIONS FOR FUTURE QUESTIONNAIRES

Question 4 to read:-

4. Age at first entry into coal industry.

Question 6 to read:-

6. Past employment in coal mines and duration, whether continuous or interrupted (years).

Question 7 to read:-

- | 7. | <u>Type</u> | <u>Duration</u>
<u>Years</u> |
|----|--|---------------------------------|
| | Other Dusty Occupations - Metalliferous Mining | |
| | - Quarrying, Brickworks | |
| | - Foundryman | |
| | - Other Employment
(e.g. chemical industry
stonemason, etc.) | |

Question 13 to read:-

13. Do you smoke? Yes/No
If you have given up the habit, indicate your pattern
in 14 below.

Question 18 - to be inserted

18. Record any serious illnesses, accidents or operations.

DISCUSSION

A total of 7 907 X-rays were viewed. Of these we reported 7 408 as normal or satisfactory, and 499 as abnormal or requiring action or comment.

TABLE I

<u>Total</u>	<u>Normal</u>	<u>Abnormal (action)</u>	<u>Other Pathology</u> <u>Abnormal</u> <u>(comment only)</u>
7 907	7 408	465	34

The thirty-four cases reported as "Other Pathology - Abnormal (comment only)" refer to X-rays where there was evident known pathology, of which the individual would be aware. These were mainly persons who had normal lung fields but presented wire suture shadows indicating coronary by-pass operations

TABLE I (Contd)

on the heart, or other cardiac operations, and other persons with normal lung fields but who had skeletal or other anomalies of which they would be aware. Individual letters of explanation were sent to such persons.

TABLE II

SUMMARY: NORMAL LUNG FIELDS

OTHER PATHOLOGY

	<u>NO.</u>	<u>REMARKS</u>
Heart Operation	24	2 cases probably congenital lesions
Other Pathology - Skeletal and other deformities	10	e.g. Multiple rib fractures, severe scoliosis, shoulder girdle injury
<u>Total</u>	<u>34</u>	

TABLE III

<u>PATHOLOGY</u>	<u>NO.</u>	<u>REMARKS</u>
Pneumoconiosis	75	Siderosis (1)
Tuberculosis	2	1 Proven - 1 Suspect
Emphysema	47	
Asbestos-related	4	Diaphragmatic calcification etc. No asbestosis found
Bullae	10	
Cyst	1	
Sarcoid	3	
Coin lesion	18	
Heart outline	76	Enlargement and/or aortic changes
Aorta	96	Kinking, dilatation, etc.
Foreign body	6	Metallic of significant size
Linear atelectasis and linear opacities	15	
Intercurrent infection	9	
Pleural thickening/changes	20	
Calcified pleural plaque	1	
Mucoid impaction	1	

TABLE III (Contd)

<u>PATHOLOGY</u>	<u>NO.</u>	<u>REMARKS</u>
Calcified primary complex	7	Calcified tuberculosis primary complex
Diaphragmatic hernia	1	
Post-operative changes	7	Rib resection etc.
Congenital anomaly	4	
Vascular ring	1	
Nipple shadow	1	
Bone island	2	
Mediastinum enlarged	8	
Technical faults	15	
Pericardial calcification	1	
Bronchiectasis	2	
Hilar prominence	2	
Hilar calcification	1	
Unidentified (minor) or for investigation	14	
Pulmonary infarct	1	Changes suggest antecedent history
Obesity	2	
Post-infection changes	7	Evidence of healing, past infection
Chicken pox/histoplasmosis	1	Requires history to classify
Under medical care (old T.B. therapy)	1	Thoracoplasty/calcified pleura
Carcinoma	2	Suspect lesions
Carcinoma	2	Known carcinoma of the lung under present active care and treatment
Inactive - tuberculosis	1	Apical scarring
Silico - tuberculosis	1	Inactive - under surveillance
Mass in lung or mediastinum	5	
Rib anomaly	3	
Skeletal anomaly	2	
Old injury (fractures etc)	8	
	<u>486</u>	

Several of the X-ray appearances appear under two (2) headings, so that there is a small discrepancy in the total abnormal X-rays reported and those listed in Table III. For example, cases of emphysema with significant associated bullous changes would appear under both headings, as would cases of emphysema with the additional presence of aortic dilatation, where a note would have been made against each presentation.

Old injuries with pleural thickening or other associated pathology would also have some influence on cross reference. This recording was held to an absolute minimum and only used where each condition was an apparent positive entity, so that the final analysis is not affected to any significant degree.

It will be appreciated that all diagnoses reflect only those reported during the Survey, so that exact pathology can only be reported where adequate follow-up has ensued.

To this end all Doctors, Hospital Superintendents and the Chest Clinic were circularised at the conclusion of the Survey and correlation of our reading of the X-ray and final diagnosis and disposal of the individual concerned will be discussed within the body of the report where appropriate information has been obtained.

APPRAISAL OF CONDITIONS OTHER THAN PNEUMOCONIOSIS:

Emphysema

Forty-seven (47) cases of emphysema were diagnosed on the X-ray appearances. The ages ranged from 25 years to 79 years.

TABLE IV - EMPHYSEMA

<u>Age</u>	<u>No.</u>	<u>Smokers</u>		<u>Severe</u>	<u>Bulla</u>
		<u>Yes</u>	<u>No</u>		
25 - 39	7	6	1	-	4
40 - 49	16	16	-	2	4
50 - 59	19	13	6	-	1
60 - 79	5	3	2	1	1
TOTAL	47	38	9	3	10

It will be noted that virtually all cases of emphysema are smokers. Of the 25 - 39 year age group, two cases presented with giant bullae, possibly congenital. In the 50 - 59 year age group, one case of unilateral bullous change was noted.

Tuberculosis:

One (1) case was clearly active, and was immediately contacted, diagnosis confirmed, and admitted to hospital for treatment. The only other case presenting X-ray appearances suggesting possible tuberculosis infection occurred in a young man. This case turned out in fact to be a right upper lobe pneumonia which resolved completely.

Mucoid Impaction:

This case turned out to be an asthmatic who had a bronchoscopy following our report.

The Unidentified Group:

This group comprised X-ray appearances of apparent minor significance, but which in the nature of things should be reported and followed in the customary manner.

Chicken Pox:

One (1) case had the typical appearance of post-chicken-pox calcification and a history would help in classifying this case. The alternative diagnoses are less likely, but pneumoconiosis cannot be excluded.

Intercurrent Infection:

Intercurrent infections were routinely reported, and the occasional case notified immediately to the Doctor named by the patient where relatively urgent therapy appeared indicated.

Sarcoid:

Three (3) cases had changes suggesting previous sarcoid. These were referred for history, follow-up, and comparison with previous films if available.

Coin Lesions:

A total of eighteen (18) coin lesions were reported, and adequate follow-up is expected.

Heart and Aorta:

Enlarged hearts and dilated and uncoiled aortic shadows were reported to the Doctors named as a general service in the event of useful therapy being suggested. Several cases indeed suggested early heart failure, but of course clinical assessment was mandatory.

Suspect Lesions: (Malignancy)

Lung masses, hilar enlargement and lesions suggesting possible malignant change were reported immediately for diagnostic purposes. Two (2) cases of carcinoma of the lung had already been diagnosed and were under treatment, and two (2) suspect lesions were reported for follow-up.

Silicosis:

Two (2) cases of silicosis were reported, one of which had been complicated by tuberculosis. This patient had been successfully treated but remains with significant scarring and opacities in both lungs.

It is interesting to note that both of these men had spent many years on tunnelling operations on the Snowy Mountains Scheme.

Miscellaneous:

One case presented with nodules which were unlike those seen in classical pneumoconiosis as they were isolated and scattered sparsely and irregularly. Inactivated parasites or other cause is postulated, and routine supervision and a detailed history as follow-up, as dust exposure was quite negligible. A similar case of unilateral nodules was notified for observation.

A young man of 20 years was noted to have an abnormality, suggesting a possible aneurysm of the aorta. As a direct result of the Survey he was investigated and a post-traumatic (motor-bike accident) aneurysm of the thoracic aorta was repaired.

Other conditions listed are mainly routine findings of no urgency, but requiring clinical assessment.

Some thirty-five (35) replies were received on case referrals, several of which provided information mentioned above.

Most of the reports detailed further clinical appraisal of the individual and confirmation of conditions such as obstructive airways disease and chronic bronchitis.

Where the Chest X-ray was in the doubtful category of early nodular changes suggestive of pneumoconiosis, a further check in one or two years' time has been proposed.

Pneumoconiosis:

A total of seventy-five (75) cases of pneumoconiosis were reported. A number of these fell into the category of suspicion leaving the diagnosis as an indication for a detailed history of exposure and certainly as a recommendation for future routine supervision at reasonable intervals.

There will always be some disagreement at this level, but suspicious shadows can only indicate some divergence from the normal. Within any dust hazard industry of which coal and metalliferous mining are predominant, such cases should at least arouse suspicion of exposure. Any degree of reassurance can only be based on subsequent supervision.

Recognition of the early shadows of pneumoconiosis is quite difficult and is easily confused with, and indeed complicated by, associated conditions such as emphysema, chronic bronchitis and asthma, any of which may be present in particular patients.

The classification used was the ILO 1980 International Classification of Radiographs of the Pneumoconioses, published by the International Labour Office, Geneva, as Occupational Safety and Health Series No. 22. (Rev)

TABLE V - PNEUMOCONIOSIS

<u>Classification</u>	<u>No.</u>	<u>Years</u> <u>Mining</u> <u>(Range)</u>	<u>Years</u> <u>(Mean)</u>	<u>Remarks</u>
0/1	5	5 - 17	12	Doubtful category
1/1 p/p	30	9 - 49	22.7	Suspect category
1/1 q/q	8	6½ - 42	25.6	
2/1 q/q	3	13 - 36	25.6	
2/2 p/p	3	32 - 50	40	
2/2 q/q	7	25 - 35	29.1	
2/2 qr/qr	1	9	9	
3/3 q/q	3	13 - 34	22.3	

The above table relates to those cases where the only exposure reported is coal mining.

The following segment relates to those cases where United Kingdom/other exposure is reported.

TABLE V - PNEUMOCONIOSIS (Contd)

<u>Classification</u>	<u>No.</u>	<u>Years Mining (Range)</u>	<u>Years (Mean)</u>	<u>Remarks</u>
1/1 p/p	2	12 - 32	22	U.K. 25 years (1) Other 10 years (1)
1/1 p/q	1	39	39	U.K. 20 years
1/1 q/q	2	20	20	Gold, Quarry, Coal
2/1 q/q	1	13	13	Coal/Tin
2/2 q/q	2	15 - 31	23	U.K. 12 years (1) Copper 15 years (1)
3/3 q/q	1	20	20	U.K. 16 years
3A/3A r/r	1	30	30	14 Coal, 16 Metal
3 B ax qr/qr	1	20	20	Also 15 years (foundry)
<u>MISCELLANEOUS</u>				
2 t	1	14 years (brickworks)		Linear opacities
1/1 p/p	1	14 years (welding)		? Siderosis
2/2 qr/qr	1	9		Unlikely Pneumoconiosis
2/2 q/q	1	21		? Pneumoconiosis ? Chicken-pox etc.
<u>TOTAL</u>	<u>75</u>			

It is interesting to record that fifty-four (54) abnormal X-rays were reported out of one hundred and twenty-three (123) of the retired miners group, but that only three (3) of these were specifically pneumoconiosis.

These were 2/2 p/p (2 cases) - 44 years av. exposure, and 2/2 q/q/ (1 case) 35 years exposure.

COMMENT

It is manifest that any large-scale Survey will produce fortuitous benefits for individual cases, but the basic reason has been to ascertain the prevalence of pneumoconiosis of whatever category in the population surveyed.

Some incongruities became apparent during the course of the Survey. The number of retired miners reporting was small and a larger cross-section of this group would have better reflected incidence of recordable pneumoconiosis.

COMMENT (Contd)

Unfortunately there are no records which establish the number of retired miners and so the proper relativity of the results cannot be deduced.

In contrast, the population surveyed in the newer mines, or more isolated areas, showed a predominance of young fit men.

It is possible that the factors reported are overweighted towards the more optimistic end of the spectrum as a result, particularly as the Survey included the total workforce including all occupations and classifications, apart from the coal miners and other workers constantly exposed to coal dust as a consequence of their work.

As a rough estimate we have reported seventy-five (75) cases of suspect pneumoconiosis in ± 7900 X-rays, an incidence of 1:105. Some of these may be proved to be other conditions on more detailed investigation, but suspicion of significant exposure must be postulated at this level.

Expectation:	$75:7900 = 0.95\%$
Retired Miners:	$3:123 = 2.4\%$ (54 abnormal, 69 normal)

It will be noted that the largest category represented is 1/1 p/p (30 cases) where some uncertainty exists in interpretation of the findings. Years of exposure ranged from 9 - 49 years, and it may be said that it is amongst this group that regular supervision should be considered.

There are factors of technique, associated conditions such as chronic bronchitis, and physical habitus which may contribute to difficulties in making an exact statement.

It is to this very purpose that the category has been assigned. The implication is that such persons should be informed of their status and routine follow-up be adopted.

Any categories above 0/1 i.e. 1/1 p/p imply a positive interpretation of the X-ray, even though some may be shown on further investigation to be related to associated factors as noted above.

COMMENT (Contd)

From the point of view of the coal mining industry the incidence of pneumoconiosis reflects the excellence of regulations relating to dust control, and adherence to the regulations by miners in all circumstances where dust may be produced at a potentially hazardous level.

The Chest X-ray status of the mining population remains the only logical and acceptable yardstick of the long-term effectiveness of the controls demanded by the Department of Mines (Coal Mines Branch) and implemented by the industry and its workforce. Anomalies of interpretation, such as X-ray appearances in excess of stated exposure, have to be followed individually.

Explanations may be forthcoming in a detailed history, e.g. hard-rock exposure for 5 years may very well explain a minimal change in a miner newly recruited to coal (See 0/1) and a complicated case may resolve itself by reference to a history of foundry experience, metalliferous mining, tunnelling, or silica-hazard industry.

There are in addition medical conditions which may make it more difficult to interpret the Chest X-ray, particularly in the case of coal miners with a significant history of dust exposure. Sarcoidosis, rheumatoid arthritis with lung manifestations, chicken-pox pneumonia with residual calcification and various intra-pulmonary parasites may all mimic pneumoconiosis, or complicate the picture of an underlying nodularity or fibrosis due to dust exposure.

There is a need to establish early evidence of pneumoconiosis for a number of reasons which are obvious in the light of the history of the condition which has been so well documented and by the present trend of international and indeed Australian practice in this field.

It is important to realise that men with well defined pneumoconiosis do not necessarily evidence any disability. The discovery of the changes permits counselling - the avoidance of smoking in particular - which may delay the onset of symptoms and/or disability. Minor degrees of pneumoconiosis do not necessarily imply ill-health or premature death.

ADVANTAGES OF A PROGRESSIVE SCHEME FOR CHEST X-RAY WITHIN THE
COAL INDUSTRY

1. Correlation of time, occupation, dust exposure, type of coal, mine location, hard-rock factors and others readily listed, with ultimate statistical statements.
2. A positive yardstick for assessment of the effectiveness of dust and ventilation control measures.
3. Constant knowledge of the exact or probable situation in relation to these matters at any time.
4. The ability to present the miner with a factual statement of his medical status for his own reassurance and necessary information.
5. A knowledge by the miners and associated work-force about mines, and their relative unions, by the coal industry itself, and the Department of Mines that these facts were available at both an overall and individual level.
6. No statement is offered on the influence of open-cut mining of coal on the prospective incidence of coal workers' pneumoconiosis. There is certainly the opportunity to investigate this aspect in conjunction with the proposed scheme outlined in this report.

RECOMMENDATIONS

The following recommendations are based on the fact that as from the first day of January, 1983, the Coal Miners' Health Scheme came into force.

The Order establishes compulsory medical examination of new entrants, and for the medical examination of employees of the Coal Industry under certain circumstances.

This system is now effectively in operation so that a medical record and Chest X-ray is available on all new entrants.

The results of the present Survey of men and women within the coal industry is available as discussed in this report.

RECOMMENDATIONS (Contd)

New entrants, whether at apprentice level or miners with any number of years of experience, may now be examined as required.

This set of circumstances limits the number of persons for whom we would suggest periodic Chest X-rays.

FUTURE PROGRAMMES FOR CHEST X-RAYS

1. Chest X-rays should be performed periodically at intervals of not less than five (5) years for the express purpose of detecting early evidence of pneumoconiosis.
2. Miners and other persons employed about mines who have been shown to have Chest X-rays demonstrating the features of overt pneumoconiosis or a pattern suggesting early changes due to the effects of coal dust/mineral dust exposure should be reviewed at more frequent intervals, preferably annual.

It will be seen that at present there are 75 persons who fall into the category described in paragraph (2) above as a direct result of the present Survey.

The ideal course is for this group of employees (that is pneumoconiosis proven or suspect) to be seen by a practitioner experienced in interpretation of Chest X-rays relating to occupation and pneumoconiosis in particular.

Certainly a means should be available for notification of those persons with pneumoconiosis as above described.

In the case of other abnormalities discovered, these would be handled in the usual way, and the individuals concerned would be advised by private practitioners, hospital clinics attended, or by the Chest Clinic, Department of Health.

3. All miners and others with significant exposure to coal dust, should be required to have a Chest X-ray performed on retirement from the industry, and the result reported to the person concerned, and filed for future reference by The Queensland Coal Board.

FUTURE PROGRAMMES FOR CHEST X-RAYS (Contd)

4. It is our firm belief that The Queensland Coal Board should consider establishing a Medical Service to co-ordinate programmes of this kind for the future.

The present Survey has provided a great deal of data on individuals, all of which is available in a haphazard fashion. There is no central authority for the storage of X-rays, or for recall of medical reports, or for notification of progress X-rays for persons where it is indicated.

In 1970 the total workforce in the coal mining industry was 2 264. (Data supplied by The Queensland Coal Board to Dr. E.M. Rathus at that time)

The present Survey has encompassed about 8 000 persons employed in the industry, and it is our view that an industry with a population of this order, with a defined occupational health hazard, requires the supervision of a Chief Medical Officer and auxiliary staff. This officer should be located either in Brisbane or Ipswich. Sub-centres could be established as needed in the future.

This officer would be responsible for the following duties:-

1. Co-ordination of the compulsory medical examination of new entrants to the coal mining industry, and liaison with medical practitioners in the various centres.
2. Organisation of periodic Chest X-ray Surveys of the workforce at appropriate intervals in the terms of the medical programme.
3. Arrange for periodic follow-up of retired miners by Chest X-ray and medical examination on a routine basis or at request.
4. Identify persons requiring further checks or for annual supervision on suspect X-ray findings.
5. Maintain a central register for the co-ordination of the programme and recording of data as required. It is most desirable that the medical examination of new entrants be centralised. This can only be done by making it a responsibility of the medical service of The Queensland Coal Board, as in New South Wales and the United Kingdom.

FUTURE PROGRAMMES FOR CHEST X-RAYS (Contd)

6. Be responsible for the investigation of occupational health problems in and about coal mines in co-operation with company activities and other Departmental agencies.
7. Medical examination of ex mine employees on request or for those ex employees identified as requiring further supervision.
8. Initiate research into occupational health problems of miners.

In 1970 Dr. E.M. Rathus prepared a report for The Queensland Coal Board in which he discussed "Proposals for a Medical Service for the Coal Mining Industry in Queensland".

Much of the detail discussed then would apply today, but it may be apposite to quote from that report in support of the present proposal to consider establishing a medical service in the coal mining industry.

"The periodic examinations are the biological yardstick of the effectiveness of dust control, and it is a sine qua non of the medical schemes envisaged that a coterie of dust-counting officers of appreciable technical expertise be appointed to maintain consecutive records of dust conditions in mines through Queensland, and to be available for special problems when needed.

This is the pattern set in the United Kingdom and by the Joint Coal Board, and it is essential to the whole scheme that the disciplines of medicine, the efforts of the dust suppression engineers, and the meticulous data of the dust sampling and ventilation officers be interwoven in a complementary manner.

We are fortunate in that acceptable standards have been proposed at an international level, and though absolute uniformity in outlook has not been attained, certainly a range of standards exists within which we may apply our ingenuities with some measure of success.

It is apparent then that a medical scheme of merit in this type of occupational hazard has no logical function without the back-up of the simultaneous collation of the relevant physical data and the prospective expectation that medical, dust, chemical and environmental factors will be available for statistical analysis."

FUTURE PROGRAMMES FOR CHEST X-RAYS (Contd)


In 1970 Dr. E.M. Rathus considered the possibility of utilising these medical services to the further benefit of the mining industry, and these observations are reproduced below:-

"In fact, once the medical services were established their application, utility and benefits to industry and the men employed, could quite conceivably be extended to embrace men exposed to pure silica in mines in addition to coal mines. The concept of X-ray Surveys of men in these industries is as well established as for coal miners".

As a total concept such a medical service would reflect Queensland's resource potential and its obligation to its workforce at the highest pinnacle of Australian and international standards.

We wish to acknowledge our thanks to the staff of the mining companies, and to the total workforce of the mines for their co-operation and interest. The co-operation of medical practitioners is also gratefully acknowledged.


E.M. RATHUS


E.W. ABRAHAMS

Appendix: Original Order
 Rescission of April 21, 1984.

* ORDER
COAL MINERS' HEALTH SCHEME

The Queensland Coal Board,
Brisbane, 8th December, 1982.

THE Queensland Coal Board acting in pursuance of authority vested in it under the Coal Industry (Control) Act 1948-1978, hereby makes the following Order, the provisions of which are to come into force on and from the first day of January, 1983.

P.J. CRANITCH, Secretary.

An order for the compulsory medical examination of certain employees in the Coal Mining Industry, made in accordance with the authority granted to The Queensland Coal Board by the Coal Industry (Control) Act 1948-1978.

The Queensland Coal Board pursuant to the authority granted to it by the Coal Industry (Control) Act 1948-1978, hereby orders as follows:-

All employees in the coal mining industry who are or who have been engaged in mining or associated operations shall have a chest X-ray - the X-ray being carried out by employees of the Department of Health under the auspices of the Director of Tuberculosis.

In conjunction with the X-ray examination there shall be a check for Emphysema.

Advice will be given to each colliery manager some six (6) weeks in advance of the programmed time of arrival of the X-ray mobile unit.

The colliery manager shall give adequate forward advice to all employees eligible for X-ray of the time table arrangements and shall be responsible for rostering of employees to allow all those eligible to be surveyed, and the colliery proprietor shall be responsible for all the costs of and any resultant or associated costs of those operations.

Employees will be contacted by the Department of Health if any follow up examination or further medical examination is necessary.

Should the Department of Health advise accordingly, The Queensland Coal Board will order a follow up X-ray and Emphysema check within five (5) years for the workforce or for such section or for such members of the workforce as necessary.

The manager of a colliery will issue to the eligible employees an X-ray identification voucher in a form approved by the Department of Health. The voucher will entitle the holder to a free X-ray and must clearly state the name, address, age and history of employment - particularly in the mining industry. Some questions on medical history also must be answered.

The Queensland Coal Board from its special fund is to meet the wage costs and travelling allowances of staff, running costs of the mobile unit, the costs of X-ray film, envelope packaging and storage, and a portion as agreed with the Department of Health of the cost of the X-ray mobile unit.

The Official Seal of The Queens-	}	
land Coal Board was hereto affixed		
on the nineteenth day of October,		
1982, by Patrick John Cranitch,		J.T. WOODS, Chairman
Secretary to the Board, the officer		M.L. NOUME, Member
designated to affix such seal, in		W.J. PLATT, Member
the presence of Jack Tunstall Woods,		
Mervyn Lewis Nourme and William		
James Platt.		

P.J. CRANITCH, J.P., Secretary.

*Published in Queensland Government Gazette, dated 11 December, 1982, Vol. CCLXXI, No. 81, pages 1676-1677.