DEPARTMENT OF MINES.
SOUTH AUSTRALIA.

DUST SAMPLING - G.P.O. - ADELAIDE.

by

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TABLE OF CONTENTS.

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This Document Consiste of 5 Pages.

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ABSTRACT.

Samples of air taken with a thermal precipitator in the mail rooms and parcels office at the G.P.O., Adelaide, show the dust concentrations to be negligible from the point of view of danger to the health of employees.

INTRODUCTION.

On the 24th. April, 1957, at the request of Mr. M.U. Travers, Welfare Officer, Postal Branch, an inspection was made of the mail rooms parcel office, and bag cleaning room at the G.P.O.. Samples of the dust on pipes and fittings in the room were taken so as to determine the nature of the dust present. The samples indicated that a large proportion of the dust was of a fibrous nature and the remainder was a heterogeneous collection of minerals. It was decided that samples of the dust in the air could be collected under working conditions by means of a thermal precipitator. Accordingly, on the 20th. May, 1957, samples of dust in five working places were taken by Mr. L.L. Mansfield.

SAMPLING.

General.

The samples were taken on a cold clear day. Conditions therefore, were favourable for the maintenance of good ventilation in working places. The actual sampling was carried

out as far as possible at a time when there was a maximum of movement in the section being tested.

The following samples were taken on the 20th. May, 1957:

Number	Working Place	Time a.m.	Time p.m.	Remarks
1	Parcels room	11.55 -	12.25	15 minutes of sorting.
2	Bag cleaning room	12.40 -	1.10	Instrument six feet west of cyclone.
3	Inland opening section	2.15 -	2.45	
4	Ship section (Basement)	3.25 -	3.55	
5	Overseas section (Basement)	4.05 -	4.40	Five minutes' break to change position of instrument.

RESULTS.

Qualitative.

A petrological examination of the preliminary samples gave the following identifications:

1. Parcels Office.

The sample is composed chiefly of fibres (paper) material and in less amount of mineral dust. The latter, in order of abundance, includes - opaque material (carbonaceous, an iron mineral and black flue dust), clay minerals, calcite, micaceous flakes, colourless or brownish coloured particles of flue dust, quartz, felspar, amorphous silica and a few accessories.

2. Bag Cleaning Room.

The composition of this sample is rather similar to that of Number five. The mineral dust contains a high proportion of black opaque particles (carbonaceous material and an

iron mineral) and subordinate amount of calcite, clay minerals, micas, quartz, chlorite, flue dust, opaline spicules and a few accessories. The fibrous material has originated mainly from paper and in less amount wool.

3. Inland Opening Section.

The sample is composed of fibres material (mainly paper), splinters of wood, red coloured sealing wax, flue dust and mineral particles. The latter include such materials as - quartz, felspar, opaque (carbonaceous material, magnetite, hematite, leucoxene and ilmenite) calcite, calcareous clay, micas, amorphous silica, fragments of carbonaceous shale and accessories (tourmaline, zircon, sillimanite, garnet, spinel, epidote, amphibole, etc.).

4. Ship Section (Opening Foreign Mail)

The sample is composed chiefly of fine colourless fibres (paper) and wool. There are also a few dark brown coloured fibres of hair (probably brush). Mineral dust is present in small amount; it comprises such minerals as quartz, minute crystals of calcite, calcareous clay, chalcedony, colourless and brown flakes of micas, altered felspar, carbonaceous material, amorphous silica and chips of glass and a few grains of hematite and limonite.

5. Overseas Section (Make up Mails)

This is composed of a mixture of mineral dust and fine colourless fibres (paper). The principal minerals of the dust are opaque black grains of carbonaceous material and iron minerals (magnetite, hematite and probably ilmenite). A transparent group of minerals is represented by calcite, highly altered flakes of micas, clay minerals, quartz, felspar, opaline spicules, flue dust, amorphous silica or glass and a few accessories.

Quantitative.

The samples by count contained about half mineral particles and half fibre particles. All were below 30 particles per cubic centimetre total mineral and fibres.

DISCUSSION.

The generally accepted standard for dust concentrations in mines is 300 particles per cubic centimetre under five microns in size. This applies particularly to mines where the percentage of silica (quartz) in the rock is high. In coal mines the allowable concentration is 700-800 particles, while in sandstone chipping or sand blasting it is reduced to 200 particles per cubic centimetre.

It will be noted first of all that half of each sample is fibre and second that there is very little free silica (quartz) and only a limited amount of silicate mineral present in the remainder. In my opinion the amount of air-borne dust in the working places does not constitute a danger to the health of the employees.

In the summer time it is possible that on a hot dusty day there would be a rise in the dust counts in the working places. I do not think that under ordinary working conditions the dust concentration would be high enough or sustained for a long enough period to constitute a danger to the employees.

SUMMARY AND CONCLUSIONS.

1. On the 20th. May, 1957, samples of dust were taken with a thermal precipitator in the mail rooms, parcels office and bag cleaning room at the G.P.O., Adelaide, during working hours.

2. Each sample was taken over an half hour period.

3. The dust in the samples was half fibre and half mineral particles.

4. The fibre particles were of wool, cotton, paper and hair.

5. The mineral particles consisted, in the main, of carbonaceous material, iron minerals, clay, mica, quartz and felspar.

6. The dust concentration of all the samples was below 30 particles per cubic centimetre including the fibre.

7. These compare with the silicosis standard for sandstone chipping of 200 particles per cubic centimetre, or 300 particles for quartz or lode mining and 700 particles per cubic centimetre for coal mining.

8. It is considered that the dust concentrations in the air of working places at the G.P.O. is not harmful to the employees.

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