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OUTLINE OF PROPOSED MONOGRAPH ON ASBESTOSIS

Saranac Laboratory Study under Grant from Asbestos Association

PART I HUMAN ASBESTOSIS

- I Human Pathology - a study of 25 autopsy cases, Illustrated
- 2 X-ray Patterns in Asbestosis, Illustrated
- 3 Ash and Mineral Values in Human Asbestosis
- 4 Complications of Asbestosis
 - (a) Susceptibility to infection
 - i Tuberculous
 - ii Non-Tuberculous
 - iii Cancer of the lung
- 5 Disability, causes and comparison with silicosis
- 6 Diagnosis
 - (a) History of adequate exposure
 - (b) X-ray film pattern
 - (c) Physical examination
 - (d) Asbestosis bodies in sputum, their significance

PART II Experimental Asbestosis

I Methods

- (a) Inhalation exposure to plant dusts.
- (b) Injection into lungs through trachea of pure minerals.
- (c) Injection of pure minerals into other organs.

2 Species Susceptibility

Man, guinea pigs, rabbits, cats, white mice and rats, dogs.

3 Peculiar Characteristics of Asbestosis

- (a) Unusual localization of chrysotile fibre in lungs.
- (b) Rate of resultant tissue reaction more rapid than to quartz.
- (c) Reaction to chrysotile not progressive after exposure ceases; again the reverse of the situation in silicosis.
- (d) Asbestosis Bodies
 - i Composition and methods of formation.
 - ii Occurrence in different species.
 - iii Formation does not parallel development of fibrosis.
 - iv Gradual disappearance after exposure ceases.

4 Comparative Effects of Different Asbestiform Minerals.

- (a) Canadian Chrysotile.
- (b) Arizona Chrysotile, low iron.
- (c) Crocidolite
 - i Bolivian specimen, stiff and elastic.
 - ii South African, soft and flexible.
- (d) Anthophyllite
- (e) Amosite.
- (f) Tremolite.

5 Effects of Control Minerals

- (a) Granular Serpentine, same chemical composition as chrysotile.
- (b) Glass Wool, a synthetic silicate fibre.
- (c) Brucite, a fibrous magnesium hydroxide almost free of silica

6 Chemical Composition of Asbestiform minerals in Relation to Irritation.

- (a) Nothing in composition correlated with relative irritative capacity.
- (b) Preliminary acid treatment
 - i Hydrochloric acid
 - ii Carbonic acid

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(c) Effects of Aluminum

- 7 Physical Properties in Relation to Irritation
 - (a) Length of fibre
 - (b) Effect of Crushing
 - (c) Heat treatment
- 8 Nature and Significance of Asbestosis Body
 - (a) Formation
 - (b) Protective effect preventing further irritation
 - (c) Ultimate solubility in tissue
- 9 Theories of Action of Asbestiform Minerals
 - (a) Chemical - reasons for considering invalid
 - (b) Mechanical - experimental demonstration of.
- 10 Complications
 - (a) Infection, tuberculosis and other varieties
 - (b) Cancer of lung - experimental data suggestive but not proven
- 11 Disability
- 12 Essential Features of Hazardous Exposure
 - (a) Nature of dust - fibrous component and size factors
 - (b) Atmospheric Concentrations - probably lower than for quartz
 - i Inadequacy of standard impinger sampling method which does not collect the dangerous fibres
 - ii Electrostatic precipitator sampling preferable but method must be modified
 - (c) Duration of Exposure
- 13 Recommendations for a New Standard of Safe Atmospheric Concentrations of Asbestos Dust
 - (a) The Quasi-official standard of 4 to 5 million particles per cu. ft.
 - (b) Work upon better method of sampling
 - (c) Necessity for comparison of results with X-ray findings in employees
- 14 Prevention
 - (a) Chemical means not practical

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- i Acidosis necessary to dissolve fibre in lungs worse than Asbestosis
- ii Aluminum Therapy inapplicable
- iii Chief reliance still upon dust prevention with special emphasis upon the fibrous components

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