

HARRY L. REINHART, M. D.

Pathologist

COLUMBUS 10, OHIO



December 10, 1955

Charles Bishop, M.D.
17 E. Locust Street
Newark, Ohio

Dear Dr. Bishop:

I have this day completed the studies of the two articles by Dr. Schepers and on the effects of glass wool on animal lungs. In the course of this study I have reviewed all of the material which you presented to me and in addition have consulted other work in the literature in the Medical Library, which has facilitated my specific interpretation of the work of Dr. Schepers.

I hope that my review and interpretation of the inferences of these articles is clear. I am in entire agreement that "dangerous inferences would be drawn by an unqualified reader" or even a non-critical physician. I think it is most unfortunate that they have not consulted with Mr. Alkman and those in authority before the articles were published. If there is any further comment you desire, I would be glad to express my opinion in regard to them. However, I must inform you that I will be out of the country on a study project for the months of January and February, 1956.

Very sincerely,

A handwritten signature in dark ink, appearing to read "H. L. Reinhart, M.D.", written in a cursive style.

H. L. Reinhart, M.D.
Box 3006
University Station

HLR/rm

encls.

Review of

An Experimental Study of the Effects of Glass
Wool on Animal Lungs

by G. W. H. Schepers, M.D., D.Sc., and Anthony B. Dilahant;
Saranac Lake, N.Y.

A.M.A. Archives of Industrial Health; Sept., 1955, vol. 12,
#3, pages 276-279

In this article the authors are reporting the technic, material, preparation and size of particles of glass wool and methods of introduction into the lungs of guinea pigs and rats. These studies were conducted from 1939 to 1947 under the direction of L.J. Gardner, M.D. whose "demise prevented the publication of reports on the results obtained." The data reported therefore is obtained entirely from the studies of this period.

Most of the data represents the numbers and kinds of animals used, survival period, and whether each animal was killed or died, with a report of the gross pulmonary lesion. There is also a comparison of the mortality ratio between guinea pig deaths and rats under "identical environmental stress." The pathological reaction in the lungs of the rats were considered insignificant.

Under comments the authors believe that the effect of the glass wool is "not wholly inert" - - - "the fibers are not fibrogenic" - - - "they do appear to be trapped in the lungs" - - - "the prevalence of pulmonary infection (abscesses) in the rat" - - - "and the frequency of focal atelectasis (in guinea pigs) are inferred as being the result of dust exposure!" If transmitted to humans the inference is that at least there would be a lowering of resistance to infection.

A note of caution is expressed against applying the information obtained from these studies to the "glass wool or glass fibers currently available to commerce" particularly because of the lighter caliber of glass wool in use at the present time. Additional studies are allegedly being made on one such product.

PERSONAL CONCLUSION - It is unfortunate that this article is separated from the next article, which is much more specific about the disease producing potential of glass wool. Many more people will read the succeeding article, in which there are very few if any notes of caution, than this article which is more technical.

Review of Article

The Biological Action of Glass Wool
by. G.W.H. Schepers, M.D., D.Sc.; Saranac Lake, N.Y.
A. M. A. Archives of Industrial Health, vol. 12, #3
September, 1955, pages 280-287

The author justifies the investigation on the basis of a potential relationship between glass wool and silicosis, from the background of silica content; and asbestosis from the "physical resemblance of glass spicules to asbestos fibers." The well known production of pulmonary fibrosis by silica and asbestos raises the question of the possibility of the "production of pulmonary fibrosis" by glass wool.

The literature is cited with reference to the irritant effects of fragments of glass wool on the skin, and the "production of pulmonary diseases of variable severity." The literature is further cited with reference to the absence of any lesions produced by glass wool fibers comparable to silicosis or asbestosis.

The author then proposes to show from his work that although "the pulmonary lesions resulting from the introduction of glass wool into guinea pig lungs" - - - "does not provoke the characteristic nodular disease associated with quartz inhalation, glass fibers of the caliber and length used in this study, when effectively lodged within the lung tissue, are nevertheless capable of producing quite remarkable lesions."

The "effective lodging within the lung tissue" was accomplished both by "intratracheal introduction" of 20 u. to 50 u. glass wool fibers, and inhalation experiments in which fibers of 6 u. or less were used.

The intratracheal introduction is followed within one month by an acute foreign body type of reaction, which results (often 12 to 18 months) in "bronchiectasia and bronchiolectasia" ("chronic dilatation of bronchi or bronchioles marked by fetid breath and paroxysmal coughing with expectoration of mucopurulent matter") and with "crypts and papillary formation."

With the inhalation experiments the reaction in the lungs begins after the 4th. month; with changes following such as "papilloma formation," "bronchitis and bronchiectasia," "cellular pneumonitis," "spurious adenomatous effect," "incipient metaplasia," and "enlarged hilar lymph nodes -" He also points out that "glass fibers are present everywhere" - - - "demonstrated by dark field examination."

In the authors comments he warns against regarding glass wool as being "innocuous" saying it should be regarded as being a potentially harmful substance by "inhalation of large quantities of the type product studied in these experiments."

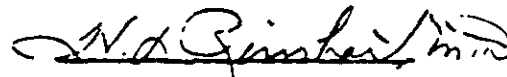
The author concludes that "short fiber, medium caliber glass wool produces - - - an interstitial pneumonitis but dominantly an endo-bronchiolar and peribronchiolar lesion" which is broncho-pneumonia and bronchial epithelial hyperplasia, which, while he does not definitely state it, permits an inference of carcinogenic properties!

PERSONAL CONCLUSIONS: These are my interpretations of what the author has concluded from his experiments. There is insufficient detail or scientific evidence produced to permit a critical evaluation of his work. I am not impressed by the character of his illustrations or figures which are for the most part poorly done.

If the conclusions he has reached are justified, the inhalation of glass wool fiber of this type constitutes a serious industrial hazard. There are implications of "bronchiectasis" which in man is a serious condition with a long drawn-out clinical course, usually only relieved by removing all or part of a lung and tumor producing ("oncogenesis") potentialities which at once raises the question of the possibility of this material producing carcinoma of the lung.

I therefore feel that the note of caution that was expressed in the first article has been thrown to the winds in this article, and very serious implications are suggested, which if substantiated by further work or the work of others, would be more serious than the Industrial Hazard of Fibrosis or Asbestosis.

Personally I am not impressed. The evidence of serious disease of these types in workers and those exposed to this material (humans) has not been produced - and as far as I can ascertain is not in the literature. Furthermore it is a big jump from animals exposed to these artificial conditions and humans - and finally, the experiments should be carried out by others, with confirmation before I would accept these results.



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