ble 2.—*Ferruginous Bodies in ...an Lungs in Autopsy Series*[a]

Year	Percent Positive
1963	76.4
1965	27.7
1965	41
1965	39.2
1966	57.6
1966	48
1966	42

...R smears except series from Finland ...ns were examined.
... and I. R. Tabershaw, unpublished

reports were on the basis of rel... asbestos bodies per case. ... with many bodies, there were ... invariably occupational or res... as to a source of asbestos and ...ost commonly in males. ... of the series, all small, when ...were attempted with diagnosis. ...ny apparent association with ... or other specific causes of

... ample evidence in the litera... called asbestos bodies can be ...ers with exposures other than ...raphite workers, soft coal min... ...eous earth workers, etc. ...ous bodies can be produced ... in guinea pigs with other ...ably, they represent a nonspe... to any relatively insoluble ...d in the lungs. ... this, Cooke[31] said, ". . . ...son why any fine spicule of ... not have colloidal matter ...nd it and become moulded ...ody. But as no other mineral ... this occurrence must be s... negligible from a diagnostic

... now, is Cooke's statement o... ... today? Or, are we adding ...kinds to our environment. ...ng picture of our human

...ole, many of the bodies that ...re really asbestos minerals. ...determine their significance ...el to draw the conclusion ... know that they necessitate ...demic of neoplasms. It is quite warranted to speculate on the matter, however. It is important not only to identify positively these ferruginous bodies but also to quantitate them in populations with known exposures to various fibrous minerals. If those with small or moderate numbers of asbestos bodies show no detectable increased risk of disease, then one could feel more secure about those in whom the bodies are scant in number.

It is also important to learn the sources of these fibrous minerals that are found in lungs. The view that asbestos minerals are indestructible is not quite true; this is a relative term only, and we cannot assume that the millions of tons used annually actually enter our physical environment forever. Many are bound indefinitely into products that do not release them; those that are released are subject to the effects of heat, acids, and other insults to minerals. Nevertheless, it is important to get a better idea of our asbestos balance, so to speak.

Summary

In summary with the increasing use and indispensability of asbestos minerals, there has come realization of some very real hazards that must be better defined and controlled. Present standards for dust control do not appear adequate to prevent asbestosis over a working lifetime, and many segments of industry aggressively attacking the problem have already been using more rigorous standards. The associations between asbestos minerals and malignancies of the lungs, pleura, and peritoneum have become increasingly convincing. Current efforts must be directed toward better definition of the importance of type, size of fiber and the importance of co-factors. It has been suggested that asbestos fibers act as carriers of carcinogenic metals or other substances to vulnerable sites. The demonstration of ferruginous bodies in from one-quarter to one-half of the lungs examined in consecutive autopsies in a number of cities around the world points to an urgent need for the positive identification of the mineral fibers that are responsible. If they prove to be asbestos, we do not know what point on the dosage response curve is represented and consequently are not now in a position to estimate their significance in terms of human health

Conclusions

I have one final set of conclusions. I think you will notice that I have not conformed to the usual pattern of talks with titles such as the one I was assigned, lining up on the one hand a list of the things we really know and then decrying unwarranted and mischievous extrapolations. Actually, that could have been done here, as I do think misleading statements have been made with respect to asbestos. The more fundamental problem is one that is a major affliction of occupational health. We often try to emphasize that part of the challenge of the field is that it is at the forefront of medicine and technology, where environmental hazards can first be detected, in view of the relative levels of exposure and the opportunities to study populations at risk. But when relationships are actually suspected and then gradually established, very real and practical consequences become apparent. So the speculations, call them fancies if you will, that are part of the normal process of developing new knowledge in other fields become menacing and are misused and misunderstood. Polarization of views and severance of communication is the rule, not the exception. I think that this has been the case history of much occupational disease research in the United States, and I cannot say I know how it could be eliminated. I do believe, however, that scientific progress requires both fact and fancy.

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