

October 13, 1949

Dr. H. H. Smead,  
Medical Director,  
Solar Aircraft Company,  
18th and Grand Avenue,  
Des Moines 5, Iowa.

Dear Doctor Smead:

The first and second sentences in your letter of September 29 gave me quite a shock. I do not have any idea of the nature of the practical problems which give rise to your needing complete information on the series of dusts to which you have referred, but I can tell you that there are a great many people, including medical investigators, who would like to have such information. The fact is that there is very little information on these materials, and that there will not be such information until systematic investigations have been carried out over some considerable period of time. Of the metals in general, lead is almost the only one that has been investigated exhaustively, and there is still very much that needs to be known about even this metal. The information on most of the other metals is quite fragmentary, and up to the present the need for the information on these has not been of such practical urgency that systematic investigations have been sponsored and financed. The investigators who have had reason to be interested have not had the funds that would enable them to carry out the necessary work. This is a costly type of investigative work, and I see no likelihood that the information you seek would be obtained within any finite period of time, unless you or other interested groups find the means of sponsoring and financing investigative work along these lines.

You may be justified in your fear of disease of the lungs following in the wake of the inhalation of significant quantities of these and other metallic dusts. A good example of what can happen has been provided by beryllium, which is now known to be capable of causing an acute type of pneumonitis and a chronic fatal form of disease of the lung. At the present time there is reason for believing that certain of the chromium compounds, more particularly the mono-chromates, are capable of producing pulmonary cancer. From time to time there has been fragmentary evidence that would suggest that nickel may do the same thing. Cobalt is also somewhat suspect in this regard, but with very little evidence, if any. It might be suspected that many of these dusts, in an appropriate state of subdivision, would cause metal fume fever. This disease, as you probably know, is benign, but there may well be other forms of pulmonary disease of a chronic type, and there will probably

Dr. H. H. Smead - (2) - October 13, 1949

also be systemic effects under suitable conditions. I should be inclined to feel that titanium will prove to be harmless, but that is very little better than a prejudiced guess.

I just noted your specific question in relation to beryllium. This is a particularly sore subject, since the commonly fatal chronic pulmonary granulomatosis has not yet been reproducible in animals. The epidemiological information is such as to virtually convict beryllium as the causative agent. The disease has been seen in association with various finely divided beryllium compounds as well as with metallic beryllium fumes given off in the manufacture of beryllium alloys. We do not know the level of concentration in the atmosphere which is dangerous, but this is of such a low order of magnitude as to pose a very serious problem of control. If you are in any situation in which your employees are exposed to beryllium dusts, you should institute a program of rigid medical supervision, and see that every effort is made to provide environmental control to the greatest possible extent at the earliest period of time.

I realize that I have not given you much specific information in response to your request, but I should like to point out to you that the information on these metals gathered by my associate, Doctor Francis F. Heyroth, and introduced into Frank Patty's book, was the result of the careful, systematic and comprehensive search of the available literature. It seems unlikely that much information of consequence was missed. Moreover, it was Doctor Heyroth's deliberate attempt to interpret this information as far as possible in its relations to industrial health. It seems likely, therefore, that such questions as have not been answered are not answerable on the basis of present information.

Finally I know of no information on the garnet type of material to which you refer.\* I should suspect that it was relatively innocuous, but I should think that this matter would require investigation before such a conclusion would be justified.

Cordially yours,

---

Robert A. Kehoe, M. D.

RAK ef

\* There may be information in some of the literature of our library, but I have not been able to take the time to investigate the matter in preparation for this reply. Literature searches are often very time-consuming, and my familiarity with the recent material on various dusts is not such that I can rely upon it in many matters.