KEASBEY & MATTISON COMPANY

AIR MAIL

MANUFACTURERS OF ASBESTOS AND MAGNESIA PRODUCTS SINCE 1873

AMBLER, PENNSYLVANIA

June 17, 1943

K&M No. 2895

W. W. F. Shepherd, Esq.
Turner & Newall Ltd.
Spotland, Rochdale

Dear Mr. Shepherd:

Re: Dr. Leory U. Gardner's
Asbestos Dust Experiments

Further to your letter, T&N No. 2884 of May 15th, to which was attached a copy of some notes made by Dr. Francis after perusal of the outline of the proposed monograph by Dr. Gardner, I now hand you herewith copy of Dr. Gardner's letter dated June 9, 1943 to Mr. Vandiver Brown, Secretary of Johns-Manville, replying to the questions raised by Dr. Francis.

You will also note from the penultimate paragraph of Dr. Gardner's letter that he does not anticipate completing the final report before January 1944 on account of additional work, which he feels is necessary, as well as the manpower shortage.

Yours sincerely,

KEASBEY & MATTISON COMPANY

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Att.

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THE SARANAC LABORATORY
FOR THE STUDY OF TUBERCULOSIS
of the Edward L. Trudeau Foundation

Saranac Lake, N. Y.

June 9, 1943

Mr. Vandiver Brown, Secretary
Johns-Manville Corporation
22 East 40th Street
New York, New York

RSB

Dear Mr. Brown:

I am pleased to submit the following comments on Dr. Francis' pertinent questions about our experiments upon asbestosis. He is correct in assuming that these points will be discussed in the forthcoming publication but for his benefit I will amplify them at the present time.

The differences that we have observed between Bolivian and South African blue asbestos may not apply generally to commercial products. We worked only with small samples furnished us by Professor Larsen of the Harvard Department of Mineralogy, which he had selected because of their purity. In these particular samples the differences in fibre flexibility were very obvious; the Bolivian material being composed of a bundle of straight, stiff fibres over 3 inches long while the South African sample was a block of mineral from which the fibres could be scraped off as a fluffy mass of fine fibre. In our effort to determine the effect of very pure substances we may have defeated one of our purposes. Nevertheless, I trust that the further experiments still in progress with the latter type of asbestos may establish the importance of fibre flexibility in the production of pulmonary fibrosis.

The question of tuberculosis in association with asbestos is one that has been long discussed. All observers have been impressed with the very obvious differences in the incidence of this infection in American and English asbestos fabricators. I have corresponded with Dr. Mereweather about this subject for many years and on the occasion of his recent visit to this country we discussed the matter at great length. Unlike silicosis, which is universally associated with an excessive incidence of tuberculosis, asbestosis is apparently so complicated only in certain locations. In the United States surveys of asbestos workers have never revealed an usual frequency of this infection. In Quebec the rates are high but as far as one can learn they do not surpass the generally high rate for that province. In England, the incidence of tuberculosis in asbestos factories is generally accepted as excessive but the basis for belief is largely post mortem material. I know of no report based upon roentgenographic surveys of large groups of living employees. While autopsy

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studies are extremely valuable and as a pathologist I would be the last to belittle their significance, I cannot help but feel that selection of cases may have influenced the picture in England. The cases that die of tuberculosis in institutions are apt to come to autopsy but we do not know the proportion of the cases dying of other causes that may have escaped this method of diagnosis.

In animal experiments, done with Canadian chrysotile, there is no such tendency to increased susceptibility to tuberculosis as observed with quartz. In asbestotic guinea pigs, infected with tubercle bacilli of low virulence, the infection may spread for a time but after some months it generally heals with the formation of scar tissue which accentuates the fibrosis produced by the asbestos. In the case of silicosis, on the other hand, such infection is continuously progressive and ultimately terminates in death. The result with asbestos much more closely simulate those produced by infection in combination with relatively inert mineral dusts like coal, iron or gypsum and various non-fibrous silicates.

Not a few of Dr. Mereweather's cases of tuberculosis i asbestos workers occurred in the same families. He sent me one group of specimens in which five had the same surname. This would point to a strong familial factor and one cannot escape the conviction that th same result might have been observed had these people been working in some other industry. Personally, I do not believe that asbestosis creates specific predisposition to tuberculosis or otherwise this effect, as in silicosis should manifest itself throughout the world. I believe that the exceptional English experience is a manifestation of the effect of more general social-economic factors that may prevail among the workers in that country.

The question of carcinogenic action from asbestos is by no means settled. Gloyne in England is strongly impressed with its probability; I have always been most sceptical and it was not until ou chance observation upon mice raised questions that I gave it serious consideration. I hope that we may be able to obtain funds for further investigation of this point. Until that is done I shall maintain the same attitude and say nothing about our observation.

I am sorry that confusion has arisen over the question of the effects of aluminum. The references to this matter were necessarily abbreviated but they are based upon five years of experimental study of the influence of this substance and its compounds upon quartz These happened to have been started before we had heard that Denny, Robson and Irwin were using metallic aluminum, but have not yet been reported. We hit upon the fact that colloidal alumina would effective neutralize the toxic action of quartz. Subsequently, we discovered th

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apparently only the alpha monohydrate of aluminum has this effect. Other forms of alumina seem to be quite inactive. The Ontario investigators found that in silicotic animals treated by inhaling metallic aluminum, the quartz particles were coated with a layer of alumina as alpha monohydrate. It would therefore appear that the metallic particles dissolve in the tissue to form the alpha monohydra and that this is the ultimate inhibitor substance. Since this is the case we have continued to work with this particular compound as we fo that it also possesses other advantages over the metal itself.

When we applied this same compound to asbestos the res were quite different from those obtained with quartz. I showed Dr. Mereweather our dissappointing results when he was here and we di cussed the similar experiments which King and Belt are doing in Engla

Mr. Muehleck asks when the final report will be receiv It is my feeling that before publication we should complete the few experiments still in progress upon the action of different forms of blue asbestos as this is a matter of practical importance. I might point out further that a method for producing asbestosis bodies has recently been published which may enable us to obtain a sufficient quantity of these bodies to test their action on the lungs of suscept animals. Should they prove incapable of causing fibrosis, as I antic pate, we would have further confirmation of a protective mechanism. T in turn has an important bearing upon the matter of progressiveness of asbestosis; if in the formation of the asbestos body the capacity of t mineral fibre to irritate tissues is destroyed, then there should be r progression after exposure ceases. We have already applied the new technique in the hope that we may obtain enough coated fibre for test. The latter would require another year for decisive results. However, we should have some indication of the ultimate outcome within 2 or 3 months and can then decide whether the final answer is worth waiting f In the mean time I shall start assembling the many illustrations that will be necessary for such a monograph and will work on the actual writing as fast as I can. In no event could I promise anything before January 1944. A curtailed staff and the necessity for almost constant traveling leaves few evenings that I can devote to the business of writing.

I greatly appreciate Dr. Francis' interest and trust th the above amplifications have clarified the points that he has raised. Should he or any other contributors have further questions I would be happy to have the benefit of them in the preparation of any final report.

Sincerely yours,

/s/ Leroy U. Gardner

Leroy U. Gardner, M. D.
Director

LUG:RBH

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