FILE NAME: Johns-Manville (JMA)

DATE: 1950-1956

DOC#: JMA164

DOCUMENT DESCRIPTION: Diatomaceous Earth Studies with Memos, Minutes, Letters & Report

MILTON J. HALVERSON, M.D.
DIRECTOR OF PUBLIC HEALTH

April 29, 1952

Dr. Anthony J. Lanza
Medical Consultant
Johns Manville Corporation
22 East Fortieth Street
New York, 16, New York

Dear Dr. Lanza:

At Dr. Smart's request, I am sending you a copy of a monthly bulletin which has been routinely distributed by our Bureau of Adult Health. As you can see, the subject matter of this issue is not so routine.

Distribution had already been partially made before this was called to the attention of the Division Office, and although we have temporarily discontinued distribution, I think we shall look less conspicuous if we send out the rest. Had we seen the draft in this office, I think we would have postponed a discussion of this subject until some future date. Certainly we would have done some editing; however, the thing is done.

Sincerely yours,

Frederic M. Krieta, M.D.
Assistant Chief, Division of
Preventive Medical Services

FMK:dr

[redacted]

[redacted]

[redacted]

B574
Seq #1.
Letters, air samples, Policy Committee (30 pp)

Diatomaceous Earth
Aluminum "Therapy"
Studies 1950-51

[redacted]

Transcribed
Study Group
7/7/44

Case #35-7 1/8/51

Great Lakes Carbon Corporation

GLC

18 EAST 48TH STREET, NEW YORK 17, N. Y.

CABLE ADDRESS: PETROCARBO NEW YORK · TELEPHONE ELDORADO 5-6200

9/7 Hart Dm H

August 28, 1951

Mr. J. P. Woodard
Johns-Manville Corporation
Twenty-two East Fortieth Street
New York 16, New York

Re Diatomaceous Earth Pneumoconiosis Investigations

Dear Page:

Shortly after our visit to Saranac Lake, I forwarded samples of the diatomaceous earth quarried and processed at Terrebonne, Oregon and Basalt, Nevada, to Dr. Vorwald. Since that time I have, on several occasions, telephoned or written him and asked that, at his earliest convenience, he finish his analyses. To date, I have heard nothing.

There are four employees at Terrebonne who have had positive X-ray findings. One is a positive TB; two are possible P-1's and one is a probable P-1. There are no employees at Basalt who have had positive chests.

I have asked Dr. Vorwald and Dr. Smart to give me their opinions on this subject, and I have further asked our laboratory to run a complete analysis on all three materials, i.e., calcined flux, calcined and natural earth from Terrebonne and Palos Verdes, and the natural earth from Basalt, Nevada.

Sincerely,

Donald R. Tellefsen

DRT:bk

Copies sent to: A. S. Elsenbast
A. B. Cummins, Manville Research
(9-6-51) A. J. Lanza, M. D.

(filed in separate expansion folder with other literature)

Research Center
August 31, 1951
File: 259-R1-5

A. S. Elsenbast - GHQ

References on Dusts, Silica, and Silicosis

We are sending to you a number of copies of literature references on the above which you requested. A complete duplicate set of these references is being sent to Mr. Woodard as you requested. All of the references on the original list which we were to obtain have not been received and the remaining items will be sent to you as soon as they are available. The complete list of references follows--starred items are being forwarded to you and Mr. Woodard today.

1. Gye, W. E., and Purdy, W. J.: Poisonous Properties of Colloidal Silica, Brit. J. Exper. Path. 5:238, 1924, pp. 238-50.

* 2. Gardner, L. U., and Cummings, D. E.: The Reaction to Fine and Medium Sized Quartz and Aluminum Oxide Particles, Am. J. Path. 9:751, 1933, pp. 751-63.

* 3. (a) Kettle, E. H.: Interstitial Reactions Caused by Various Dusts and Their Influence on Tuberculous Infections, J. Path & Bact. 35:395, 1932
(b) Haldane, J. S.: Tr. Inst. Min. Eng. 55:264, 1917

* 4. Denny, J. J., Robson, W. D., and Irwin, D. A.: The Prevention of Silicosis by Metallic Aluminum II, Canad. M. A. J. 40:213, 1939, pp. 213-38.

* 5. Gardner, L. U., Dworski, M., and Belahant, A. B.: Aluminum Therapy in Silicosis, J. Indust. Hyg. & Toxicol. 26:211, 1944, pp. 211-23.

* 6. Brenner, F.: Antidotal Rocks and Silicosis, Canad. Mining J. 60:589, 1939, pp. 589-95.

* 7. Haynes, F.: Experimental Dust Inhalation in Guinea Pigs, J. Hygiene 31:96, 1931, pp. 96-123.

* 8. Belt, T. H., and King, E. J.: Failure of Aluminum to Prevent Experimental Silicosis, J. Path. & Bact. 55:69, 1943, pp. 69-77.

9. Goralewski, G.: Clinical and Animal Experimental Studies and the Question of the Aluminum Dust Lung, Arch. f. Gewerbepath. u. Gewerbehyg. 9:676, 1939; The Symptomatology of the Aluminum Dust Lung, ibid. 10:384, 1940; Clinical Study of the Aluminum Lung, ibid., 11:106, 1941.

* 10. Dernehl, C. U., Nau, C. A., Frank, T. M. and Neidhardt, H. W.: Experimental Studies on the Action of Silica Gel Catalyst Administered to Guinea Pigs by Inhalation, J. Indust. Hyg. & Toxicol. 31:32, 1949, pp. 32-40.

* 11. Denny, J. J., Robson, W. D., and Irwin, D. A.: The Prevention of Silicosis by Metallic Aluminum 1, Canad. M. A. J. 37:1, 1937, pp. 1-11.

12. King, E. J., and Belt, T. M.: The Physiological and Pathological Aspects of Silica, Physiol. Rev. 18:329, 1938, pp. 329-65.

* 13. King, E. J., and McGeorge, M.: The Solution and Excretion of Silica, Biochem. J. 32:426, 1938, pp. 426-33.

14. Johnstone, R. T.: Occupational Medicine and Industrial Hygiene, St. Louis, C. V. Mosby Company, 1948, p. 382.

* 15. King, E. J., Roman, W., and McGeorge, M. : The Depression of Silica Solubility in Body Fluids by Minerals Dusts, Proceedings of the International Conference on Silicosis, International Labour Office Studies and Reports Series F (Industrial Hygiene), no. 17, Geneva, 1938.

* 16. King, E. J.: Chronic Pulmonary Disease in South Wales Coalminers: III. Experimental Studies; B. The Solubility of Dusts from South Wales Coal Mines, Medical Research Council, Special Report Series, no. 250, London, His Majesty's Stationery Office, 1945.

A. B. Cummins

cc: J. P. Woodard - GHQ
R. R. Williams

FILE COPY

GREAT LAKES CARBON CORPORATION
18 East 48th Street, New York 17, N. Y.

August 28, 1951

Mr. J. P. Woodard
Johns-Manville Corporation
Twenty-two East Fortieth Street
New York 16, New York

Re: Diatomaceous Earth Pneumoconiosis
Investigations

Dear Page:

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Sincerely,

/s/ Donald R. Tellefsen
Donald R. Tellefsen

DRT:bk

Copies for: A. S. Elsenbast
A. B. Cummins, Manville Research
A. J. Lanza, M. D.

P. S.: This letter from Mr. Tellefsen is in connection with ABC's letter to me of July 20 asking if we have an answer. Perhaps the second paragraph implies that this material also causes chest changes.

J. P. Woodard - 9-6-51

FILE COPY

F.U. 9/6

August 21, 1951

Dr. A. J. Vorwald, Director
The Saranac Laboratory
Saranac Lake, N. Y.

Diatomaceous Earth Pneumoconiosis
Program for Testing Powdered Aluminum Hydroxide

Dear Art:

In answer to my letter of October 25, 1950, you letter of November 11, 1950 said there would be a final report on this test on diatomaceous earth, which would also constitute Interim Progress Report No. 4, when the project is completed, about August 1951.

I wonder if you would tell me what the status of this program is at the moment and when we may expect the final report.

Yours very truly,

J. P. Woodard

cc: Dr. A. J. Lanza

FILE COPY

F.U.

August 15, 1951

Mr. Lawrence O. Cooper
McIntyre Mine
Schumacher, Ontario, Canada

Dear Larry:

You and others there very kindly reviewed the entire aluminum therapy picture when we were there and gave us a substantial amount of data on the work that has been done.

I recall clearly the practice being followed there in the clothes-change room where a certain amount of aluminum powder was dispersed in the atmosphere from each of the four corners of the room just before the men came in to change clothes. As I remember it, about 700 men changed clothes in this one large room, counting those who were coming on shift and those who were going off.

Could you give me the following information:

1. What are the dimensions of the room itself, or what is the cubic footage of the room?

2. How much aluminum powder is in each of the small cans, in grams or in whatever weight measurements you use?

3. How many cans are dispersed in the atmosphere each time? My recollection is that one can was dispersed at each corner, though there might have been more than one.

4. Roughly, what is the particle size of the aluminum powder that is dispersed?

5. What is the approximate concentration of aluminum particles in the room atmosphere after the contents of the cans have been dispersed in the atmosphere, in millions of particles per cubic foot or in whatever terms you usually express it?

I feel sure that all of this information is among the data that you gave me, but I have been unable to locate it, and I hope it will not be too much trouble for you to give me the answers to these five questions, which you probably know without even looking them up.

I hope all is going well with you and that you are having much pleasure in your day-to-day activities in these troublous times.

With very best wishes,

Sincerely yours,

J. P. Woodard

bc: H. M. Jackson

FILE COPY

FU ~~8/17~~ ~~8/20~~ ~~9/11~~

August 14, 1951

Dr. A. J. Lanza, Chairman
Institute of Industrial Medicine
New York University-Bellevue Medical Center
477 First Avenue
New York 16, New York

Dear Tony:

Attached is the rough draft of the memorandum that you left with me which covers your slant on the matter of diatomaceous earth pneumoconiosis and aluminum therapy.

I think it is concise and clear, and that it should have the effect of bringing some order out of chaos.

I have made two or three notes in blue pencil, which are self-explanatory.

On the top of page 4, you mentioned experience in Canada and the U. S., and in the case of each country, spoke of about 19,000 individuals. I have no knowledge here as to the figures, but only mention this because of the fact that the same number of individuals in each country seemed odd and thought perhaps it might be a typographical error.

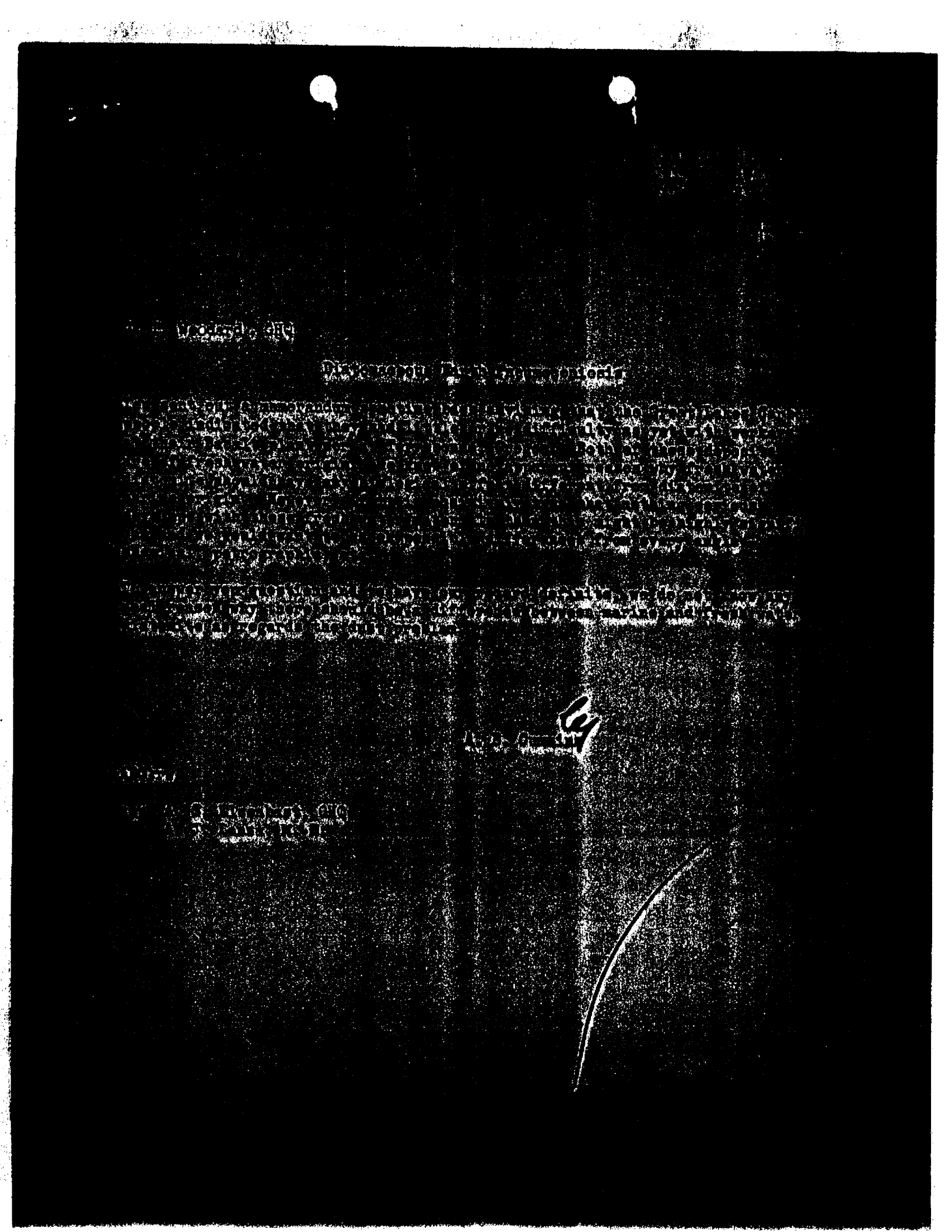
I feel sure the people in the other company in our industry will have the same reaction to your memorandum, which I hope you can issue very soon.

Received 9/10/51

Sincerely yours,

Enclosure

J. P. Woodard



FILE COPY

Confidential

July 17, 1951

A. S. Eisenbart

Industrial Hygiene - Lompoc
Visit to Saranac

When we were at Saranac, several points were raised that were later to be covered and that you mentioned in the memorandum that you are now writing. We have had correspondence with Dr. Vorwald since that time to clear up these questions, and, in the meantime, Dr. Lanza spent some time there and wrote a memorandum of July 10, copy attached, covering the four major questions.

The first question was about the incidence of tuberculosis at Lompoc:

> Dr. Vorwald wrote me, but did not clear any points. The second and third paragraphs of the attached memorandum from Dr. Lanza cover this point. In effect, he states that there is no proof of excess tuberculosis at Lompoc.

The next question was that on the use of cortisone:

> The last paragraph on the first page of Dr. Lanza's attached memorandum covers this. Dr. Lanza further stated that cortisone treatment on animals will not tell the story, that a try-out on people only will tell it, and he questions whether it is the proper function for a company to promote such a test.

The next question was about Dr. Vorwald's statement as to the damage that had been done to people breathing metallic aluminum dust and referred to cases in Holland that were reported at the meeting in Australia:

> The first paragraph on the top of page 2 of Dr. Lanza's memorandum covers this. In effect, he says that damage by huge amounts of aluminum dust is not significant.

The next question was about the test on tuberculin-treated pigs:

> The test Dr. Vorwald proposed in his letter was to cover a long period of time and Dr. Lanza feels that we could not wait for such a test to give us some answers. (A. J. L. told Vorwald that, too, when he was there - see A. J. L.'s letter July 10th)

Other fringe questions on the subject in general can be discussed if and when we can review this whole matter, as suggested in our conversation yesterday morning.

It might further be mentioned that Dr. Lanza is writing a memo on this whole subject summarizing his opinions as of now. This can be reviewed when we have our meeting to discuss the whole subject.

J. P. Woodard

enc
cc: H. M. Jackson

bcc: A. J. Lanza, M. D.

July 10, 1951

Mr. J. P. Woodard
Johns-Manville Corporation
22 East 40th Street
New York 16, New York

Dear Page:

On the 28th of June I spent a good portion of the day with Dr. Verwald at Saranac discussing the questions outlined in your two letters to me dated June 21st.

With respect to the incidence of tuberculosis in Lompoc, Dr. Verwald has no information on this subject and is in no position to give any. There are two phases of this question, 1) the general incidence of tuberculosis in Lompoc and the surrounding [illegible] and, 2) the incidence of tuberculosis among the employees of J-M. I don't know whether there has ever been an X-ray survey of the community as a whole. I have only the opinion given to me by the former County Health Officer at Santa Barbara that the incidence of tuberculosis in the general community in the Lompoc area was extremely low.

The matter of the incidence of tuberculosis among the employees at J-M is not simple to determine. There are in Dr. Anderson's collection of X-rays films, I think, of practically everybody in the plant. A good many of these films which show extensive lung pathology, nevertheless, are not easy to diagnose from the standpoint of tuberculosis. I would say, subject to correction by Dr. Anderson, that there is very little open tuberculosis among the employees. To what extent hidden tuberculosis may be a factor in the development of pneumoconiosis in diatomaceous earth workers is problematical. Taking everything into consideration both from the clinical and the roentgenological aspects, it seems fairly certain that the diatomaceous earth workers do not have the [illegible] of high susceptibility to tuberculosis that characterizes those exposed to crystalline silica. Whether the incidence of tuberculosis among J-M employees is higher than that of the general community remains to be shown, and it may be difficult to do this.

With respect to the use of cortisone, Dr. Verwald says he has written to you. I gather from my discussion with him that there is some basis for the belief that cortisone may be of value in early cases of pneumoconiosis. I feel that this is a complicated subject and [illegible] we cannot find out much about it unless the cortisone [illegible] with every prescription on a small select group of individuals [illegible] pneumoconiosis.

With respect to the report of the meeting in Australia, Dr. Vorwald states that he has sent you two copies of this. We went over together that portion of the report which dealt with cases of aluminum pneumoconiosis in Scandinavia, I think it was in Sweden (Dr. Vorwaldin). I told Dr. Vorwald that I did not think this was conclusive and I did not think it was germane to the general question of aluminum prophylaxis. The physician in his daily practice uses many drugs which are highly toxic; he does not hesitate to use digitalis in heart disease although digitalis may be a dangerous poison if too much is given. The fact that the Swedish workers, and if I remember correctly there were only six, developed pneumoconiosis with disabling symptoms following exposure to overwhelming quantities of aluminum, is not a bar to the therapeutic use of aluminum. Again I fall back on the fact that some thousands of men have been treated with aluminum therapeutically and, as far as is known, no harm has resulted. Any material which gets into the lung in excessive quantities will cause disability and even death including water.

With respect to your question on tuberculin-treated pigs together with diatomaceous earth and aluminum, Dr. Vorwald says he has written to you about this and has outlined a program for your consideration.

In the course of our discussion, a number of items developed which apply more or less to what has been said above. Guinea pigs exposed to diatomaceous earth plus attenuated tubercle bacilli show the same result as those which had been exposed to crystalline silica. Dr. Vorwald feels very strongly that men exposed to calcined diatomaceous earth almost certainly have an incidence of tuberculosis higher than normal. But here again we come up against a complex picture because the men exposed to calcined diatomaceous earth are also exposed to natural earth and the natural earth, he feels, modifies the action of cristobalite. It is not possible to experiment on animals with pure cristobalite because apparently one cannot procure pure cristobalite. In any event, the animals exposed to cristobalite and diatomaceous earth in combination show a distinct reaction different from that of crystalline silica. It is probable that the relationship of this reaction to tubercle infection is less emphatic than in the case of crystalline silica. Again I fall back on the fact that if the action of diatomaceous earth were analogous to crystalline silica with respect to the incidence of tuberculosis, we would see in Lompoc the same general picture of a very high tuberculosis incidence that we see in any hard rock mining camp where there is great exposure to crystalline silica.

With respect to cortisone, it should be noted that while cortisone inhibits the development of connective tissue, it has an adverse effect in the presence of the tubercle bacillus. Where guinea pigs were exposed for half an hour daily to the inhalation of metallic aluminum .88 mg./cu.ft., no harmful effect was noted. Such exposure is many times greater than would be involved in any therapeutic treatment. On the other hand, where guinea pigs were exposed a half hour daily to .88 mg./cu.ft. and then exposed seven and a half hours daily to the inhalation of quartz dust for eighteen months, the guinea pigs showed little evidence of protection. Here again, however, the factor of the dosage of silica as against the dosage of aluminum is not clear.

With respect to the question of injections of diatomaceous earth mixture with aluminum powder, Dr. Verwald stated that he had not tried the intraperitoneal injections as he felt that this particular procedure had little or no value because in order to get a reaction it was necessary to use relatively large doses. With respect to intratracheal injections, he feels that the evidence secured from this procedure is supportive only. He is not very keen about this particular technique but he is carrying it out and he thinks he will have an answer in about eight months. He feels strongly that too much weight cannot be given to this particular technique because you again have the factor of possibly overwhelming dosage which tends to mar the results.

Dr. Verwald still feels very strongly that no effort should be made to use aluminum in the treatment of employees until his inhalation experiments have been concluded which he expects will be in eight months and he feels that it is more than worthwhile to delay any action during the intervening period.

Sincerely yours,

A. J. Lanza, M. D.

AJL:lc

FW 7/18

July 12, 1951

Dr. A. J. Lanza, Chairman
Institute of Industrial Medicine
New York University-Bellevue Medical Center
477 First Avenue
New York 16, New York

Aluminum Therapy for Disteminous
Earth Pneumoconiosis Complicated
By a Tuberculous Infection

Dear Tony:

I wrote you on June 29 and enclosed a copy of a letter from Art Vorwald dated June 21, suggesting that certain tests be made.

We discussed this today and I apologize most humbly for now writing you about it so soon after our discussion.

You will recall that the first thought was to do neither the injection test, which was to cost $2,000, nor the more extended test, which was to cost $20,000. Finally, we decided to do the intratracheal injection test to try to settle the point raised by Reg Smart.

I have read Art's letter again and see that we have missed one point which I think is important, namely, he says it will take 12 months to get an answer for the injection test costing $2,000.

If it is going to take that long, do you not think we could go back to the original idea and skip it?

It is understood and still agreed that we should skip the $20,000 test that was to take 18 months and I am not raising a question about this.

Yours sincerely,

J. P. Woodard

bc: H. M. Jackson

O.K. to go by phone to skip it. — Takes too long answer of no value — DWS 7/19

FILE COPY

FW 7/30

July 12, 1951

Dr. A. J. Vermeld, Director
The Trudeau Foundation
P. O. Box 551
Saranac Lake, New York

Experimental Study
Diatomaceous Earth - Aluminum

Dear Art:

In your letter of June 25, in the next to the last paragraph, on page 2, you mentioned "concentration of both the metallic powder and the colloidal hydroxide is being maintained at a level of one part for every five parts of diatomaceous earth."

This is so much greater than the ratio that might be assumed from the solubility tests, as well as from the actual usage of aluminum in the therapy treatments at McIntyre, that I am wondering if the stated ratio is the one.

If the ratio is as stated, we are wondering if the results would be comparable with the much different ratio that might be used in actual practice. Perhaps you could tell us briefly about this, for each of us noted this and we are all wondering about it.

Yours sincerely,

J. P. Woodard

Copy to: Mr. A. E. Hinsdale
Mr. M. E. Payman
Mr. D. R. Tallafuss
Dr. A. J. Lemon

bc: H. M. Jackson

July 10, 1951

J. P. Woodard

Aluminum Therapy
Your letter June 19

Because only the range of particle size was given and not the median, the conversion of milligrams per cubic centimeter to particles per cubic foot is somewhat arbitrary. I have assumed an even distribution of particle size within the range and on this basis the concentration at 30 milligrams per cubic meter (mg/m^3) is 400 mppcf, at 60 milligrams per cubic meter is 750 mppcf and at the 300 milligram concentration experienced at the surges is 4000 mppcf.

All of these levels are extremely high and it certainly is not unexpected, in my opinion, that lung impairment should result.

H. M. Jackson

HMJ:PO'H

NEW YORK UNIVERSITY-BELLEVUE MEDICAL CENTER
NEW YORK UNIVERSITY POST-GRADUATE MEDICAL SCHOOL
477 FIRST AVENUE, NEW YORK 16, N.Y.

DEPARTMENT OF
INDUSTRIAL MEDICINE

OREGON 9-3200

July 10, 1951

Mr. J. P. Woodard
Johns-Manville Corporation
22 East 40th Street
New York 16, New York

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With respect to your question on tuberculin-treated pigs together with diatomaceous earth and aluminum, Dr. Vorwald says he has written to you about this and has outlined a program for your consideration.

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Sincerely yours,

A.J. Lanza, M.D.

AJL:lc

cc: J. P. Woodard, GHQ
A. S. Elsenbast, DHQ
E. R. Williams
File 259-R1-5

June 28, 1951

Dr. A. J. Lanza
New York University
Bellevue Medical Center
477 First Avenue
New York 16, N. Y.

Dear Dr. Lanza:

We appreciate your courtesy in sending us a copy of Dr. Schepers' letter of May 31, and we also appreciate Dr. Schepers' interest in the Lampe dust problem.

I am sure that all of us in the company want to get started in doing whatever is best on our dust problem; and since aluminum prophylaxis and therapy appears sound on the basis of present information, my personal feeling is that we should begin as soon as possible.

It is realized that there are problems in getting started and that a procedure and program is necessary to do this job to the best all-around advantage. Sufficient time should be taken to work out these details and then, in my opinion, we should go ahead.

Very truly yours,

A. B. Cummins

ABC:rm

January [illegible], 1967

Subject: Record of the First Meeting of the New York State Insulation Contractors Association

On Friday and Saturday, January 27 and 28, a meeting was held [illegible] by the Insulation Contractors of New York State. The following were present at the meeting:

NAME	COMPANY	CITY
L. E. FELTZ	MUNDET CORK	BUFFALO
R. C. BRAUN	NIAGARA ASBESTOS	BUFFALO
J. MOUSE	J. J. MORSA CO.	SYRACUSE
H. MC LAUGHLIN	TYS. PIPE, INC.	BUFFALO
A. P. KEASHEY JR.	R. A. KEASHEY CO.	NEW YORK
J. A. BAILEY, JR.	PIPE INSULATION, INC.	BINGHAMTON
J. F. SWICK	JOHNS-MANVILLE	ALBANY
B. L. KIST	R. A. KEASHEY CO.	SYRACUSE
W. S. ROWLAND	JOHNS-MANVILLE	ALBANY
D. DUDERACK	R. A. KEASHEY CO.	SYRACUSE
F. MC AFEE	ARMSTRONG CORK & SUPPLY	ALBANY
B. EAGER	R. A. KEASHEY CO.	SYRACUSE
D. DOWNING	MINER CONSTRUCTION	SYRACUSE
K. TENNITY	MUNDET CORK	ROCHESTER
B. K. MULLEN	JOHNS-MANVILLE	ALBANY

The announced purpose of this meeting was to set up as soon as possible the New York State Insulation Contractors Association.

Introductions were made from the floor with each persons name and affiliation being briefly stipulated.

Chairman, W. J. Harvey, of the Armstrong Contracting and Supply Company [illegible] the proposed Constitution and By-Laws.

The meeting was thrown open for discussion at which point B. Frederick of R. A. Keashey Co. asked for the clarification of the paragraph pertaining to purpose and intent.

Minor revisions as here in after noted were made to this paragraph.

A vote when called for showed unanimous approval for forming the association. A motion was made by L. E. Feltz of the Mundet Cork of Buffalo and seconded by F. L. Klee of the Robert [illegible] Keashey Syracuse office that a nomination committee be named. This committee to select officers of the new association. Accordingly W. J. Harvey and [illegible] Keashey of [illegible] Keashey Co. and F. McAfee of Armstrong Contracting and Supply [illegible] L. E. Feltz of the Mundet Cork and K. Tennity of the Robert Mundet Cork were [illegible] as the nominating committee. A ballot was decided for purposes of expediency that each group should [illegible] separately the name of a [illegible] executed and was learned through [illegible]

SYRACUSE - [illegible] - Alternate
ALBANY - [illegible] - Alternate
ROCHESTER - [illegible] - Alternate
BUFFALO - [illegible] - Alternate
NEW YORK CITY - [illegible] - Alternate

Continued

It was proposed and accepted that the annual meeting of this association was to be held the last week of September in Syracuse and the semi-annual meeting the first week of April in Syracuse also.

The nominating committee reported the following slate of officers:

President - - - - - - - - B. E. Mullen - Johns-Manville, Albany
Exec Vice-President - - - - - - - - R. Braun - Niag. Asbestos Corp. - Buffalo
Vice-President - - - - - - - - W. J. Harvey - Armstrong Contracting & Supply - Syracuse
Treasurer - - - - - - - - E. Orlino - Mundet Cork - New York City

A motion was made by A. P. Keachey, Jr. and seconded by L. E. Fatte that nominations be closed.

A motion was there upon made by R. Braun and seconded by R. Browning that the Chairman cast the vote for the slate.

It is therefore, recorded that the New York State Insulation Contractors Association was unanimously voted into being and the first slate of officers also named and elected in the same manner.

R. E. [illegible]
Acting Secretary

ASBESTOS & INSULATION CONTRACTORS & DISTRIBUTORS ASSOCIATION
231 JACKSON BUILDING
220 DELAWARE AVENUE
BUFFALO 2, NEW YORK

February 2, 1961

Contractors Meeting, Syracuse, New York
January 27th and 28th

Attendance:

Albany		
J. Bailey, Jr.	Pipe Insulators Inc.	Burlington, Vt.
J. F. Swick	Johns-Manville	Albany, N. Y.
W. B. Rowland	Johns-Manville	Albany, N. Y.
* B. E. Millen	Johns-Manville	Albany, N. Y.
* Frank McAfee	Armstrong Contracting	Albany, N. Y.
Don Detrick	R.A. Keasbey Co.	Albany, N. Y.
Buffalo		
* R. Braun	Niagara Asbestos	Buffalo, N. Y.
L. Pelt	Mundet Cork Corp.	Buffalo, N. Y.
H. McLaughlin	Buffalo Insula. Dist.	Buffalo, N. Y.
New York City		
* A. P. Keasbey	R.A. Keasbey Co.	New York City, N.Y.
Rochester		
* Ken Tennity	Mundet Cork Corp.	Rochester, N. Y.
Syracuse		
J. Morse	J.J. Morse Co.	Syracuse, N. Y.
* B. L. Kime	R.A. Keasbey Co.	Syracuse, N. Y.
D. Eager	R.A. Keasbey Co.	Syracuse, N. Y.
Dick Downing	G.H. Minor Constr.	Syracuse, N. Y.
* Bill Harvey	Armstrong Contracting	Syracuse, N. Y.

Not Present:

Buffalo		
* Ray Wopperer	[illegible]er Insulation	Buffalo, N. Y.
New York City		
* E. Orlino	[illegible] Cork Corp.	New York City, N.Y.
Wilbur Morriss	[illegible]ville	New York City, N.Y.

Rochester

* Bill Martins	J.A. Hebert	Rochester, N. Y.
.. Stan Stachelack	Roch. Insulation Dist.	Rochester, N. Y.

This meeting was called for by the Buffalo Asbestos & Insulation Contractors & Distributors Association. It was principally called concerning the surety bond. The meeting was arrsnged by Bill Harvey of Armstrong Cork who acted as temporary Chairman.

The contractors met Friday night with exception to New York City who had not arrived, and discussed many of the mutual problems. It seemed to be the consensus of opinion that we could best serve our companies and our customers by a state organization. For a period from about 10:00 in the evening to 3:00 in the morning, many of the problems were hammered out and a temporary constitution and bylaws drafted. Many problems which prevented this association from being formed in the past were considered and relieved.

The meeting was opened formally at 10:30 Saturday and with a great deal of discussion, the state association was formed, officers elected at 12:33. The state association will bear the name of The New York State Insulation Contractor Association, 790 Central Avenue, Albany 6, N. Y. The following officers were elected:

President - B. E. Mullen
Executive Vice President - R. Braun
Vice President - Bill Harvey
Treasurer - E. Orlino

The Secretary which is appointed by the President was Don Detrick.

The above list which shows those in attendance - the asterisks indicate the voting member from that city. Each association has two along with one alternate indicated with the dot.

Contributions to form the state association were accepted from Buffalo and Albany of $100.00 each. Each association was expected to make a contribution to the formation of the association and [illegible] time prior to September the officers would discuss and institute dues. The bank account will be kept in Syracuse; Bill Harvey will establish this [illegible].

[illegible] will be printed [illegible] with the assistance of [illegible]

FILE COPY

To see AJL

June 21, 1951

Dr. A. J. Lanza, Chairman
Institute of Industrial Medicine
New York University-Bellevue Medical Center
477 First Avenue
New York 16, New York

Dear Tony:

Just so our record here will be complete with respect to the industrial hygiene work on diatomaceous earth at Sarsena, I am noting below the plan you mentioned the other day following your conversation with Reg Smart at Atlantic City.

You said you were going to get information from Sarsena on the following:

1. Intraperitoneal injections of diatomaceous earth mixed with aluminum powder.

   a. What, if any, harm is caused by such injections?

   b. To what extent are there signs of protection caused by the aluminum?

2. Intratracheal injections - use the same mixtures and determine a and b, as above.

You said that, if this proved to be harmless, Reg Smart is then of the opinion that we could safely start aluminum therapy at Lompoc.

You mentioned that Dr. Shepard is held in high regard by the State Health people in California and that he could readily deal with them in connection with the results of these tests.

You said that you would get the results of these tests in writing so that all of us could have this information as a matter of record.

Sincerely yours,

J. P. Woodard

bc: H. M. Jackson

November 7, 1950

J. P. Woodard

Returned herewith is Dr. Vorwald's proposal of October 6 entitled "Powdered Aluminum Hydroxide in Diatomaceous Earth Pneumoconiosis".

I have only the following comments:

1. The proposal suggests a sub-experiment with "cancer-bearing mice" to determine any possible relationship between diatomaceous earth pneumoconiosis and pulmonary cancer. If these mice would be either (a) those already afflicted with cancer or (b) the type (referred to in one of Dr. Gardner's interim reports on asbestosis) that have had a predisposition to cancer, I fail to see how the experiments would produce any valid results.

2. It is noted that before publication of any of the results, we would merely have an opportunity to "review" the manuscript. This is a far cry from the commitment Dr. Gardner formerly made that nothing would be published without our consent. However, as a practical matter, Dr. Gardner's undertaking proved ineffective because he let the matter dribble out at Symposia or as paragraphs or footnotes in articles dealing with the general subject of pneumoconiosis.

Vandiver Brown

VB:S
Enc.

cc A. S. Elsenbast
A. R. Fisher

[illegible] ONTRA[illegible] DISTR[illegible]

[illegible] entered into very serious [illegible] discussion of the survey bond [illegible] Section 55 was distributed [illegible] that all would be ready [illegible] at which time a varied [illegible] was given as to the [illegible] the intent, and the purpose of this bond. It would [illegible] to record here all of the opinions but it was decided that the President be instructed to arrange a meeting with the State Architects office for the purpose of establishing the answer to the above questions. Following this information, [illegible] officers would take the [illegible] and if necessary [illegible] meeting will be called of the association in order to [illegible] a plan of action.

[illegible] were made such as the hiring of a legal consulting [illegible] or possibly the construction industry. This was [illegible] until we had more information.

As [illegible] meeting, all [illegible] procedure and wher[illegible] to the bond.

[illegible] Secretary

[illegible]

In file 6/29 ~~HRJ~~ DMH

THE TRUDEAU FOUNDATION

FOR THE CLINICAL AND EXPERIMENTAL STUDY OF PULMONARY DISEASE

SARANAC LABORATORY
TRUDEAU LABORATORY
TRUDEAU SCHOOL

OFFICE OF DIRECTOR
P. O. BOX 581
SARANAC LAKE, N.Y.

DEPARTMENT OF BIOCHEMISTRY
DEPARTMENT OF PHYSIOLOGY
DEPARTMENT OF RADIOLOGY

June 18, 1951

Mr. J. P. Woodard
Johns-Manville Corporation
Twenty-Two East Fortieth Street
New York 16, New York

Re: // Incidence of Tuberculosis in Diatomaceous Earth Workers //

Dear Page:

Question #1 JPW's letter 5/14 to AJV

The clinical evidence in the files of The Saranac Laboratory pertains to post-mortem specimens of lungs of twelve individuals who had been exposed to diatomaceous earth. These specimens have been forwarded to us for study from time to time for the past twelve or thirteen years.

With respect to the incidence of tuberculosis, two cases are complicated by a tuberculous process, atypical in one and miliary in the other. Two other cases are questionable since the infection is considerable modified and thus cannot be identified specifically as tuberculous. The tissue from still another case was in a very poor state of preservation. There are, therefore, seven of the twelve cases without evidence of infection.

In my opinion, the number of cases is much too small for statistical evaluation concerning the incidence of tuberculosis in diatomaceous earth workers. Furthermore, you will appreciate that the cases are selected ones and thus do not represent a valid sampling of the entire working population. It is obvious that reliable evidence regarding the incidence of pulmonary tuberculosis in individuals exposed to diatomaceous earth dust must be based upon a clinical study of a large number of those workers. Such a study should be compared with a similar study of the incidence of tuberculosis in the non-exposed population from the same geographical area. Both Doctor Smart and Doctor Anderson are in a position to investigate this problem and I would rely upon their judgment concerning the matter.

The experimental results with guinea pigs furnish incontrovertible

This does not prove a high incidence of TB at Saranac! That and question

Right!

evidence that diatomaceous earth products, including the natural, the regular flux-calcined and the special flux-calcined, have an adverse influence upon a tuberculous infection.

With every good wish,

Sincerely yours,

Arthur J. Vorwald, M. D.
Director, The Trudeau Foundation
and The Saranac Laboratory

AJV:lr
cc: Mr. A. S. Elsenbast

Extracts from Third International Conference of Experts on Pneumoconiosis, Sydney, Australia, March 1, 1950

Professor S. Forsman: I should like to deal with recent experiences in Sweden on pneumoconiosis produced by the inhalation of inorganic dust without silica.

Our experiences of silicosis are written in the reports that have already been presented to the Conference, and therefore, it will not be necessary for me to deal with that here. We have had four problems on pneumoconiosis. The presented material is small, but I think the results are of principal interest.

400 mppcf

In Sweden we have only one plant providing aluminium powder. The industrial process is that you have almost pure aluminium - 99.6% which is cast into pellets and hammered in hammer mills to powder, with particle size of between one-half and two microns. The dust exposure in this plant is very heavy, being thirty to sixty milligrams per cubic metre air at usual work.

No effect

When emptying the mills the dust concentration for a short period could raise to 300 mgs. per cubic metre. There were only nine men exposed in the plant.

4000 mppcf

We started our investigation in 1947, when they all had been x-rayed and examined. There were then two with x-ray changes and two were suspicious. In a mass investigation in miniature x-ray in the surroundings we discovered another case which was found to have been previously employed in this plant.

In 1949 we discovered two new cases.

These four men employed in the plant were exposed to aluminium dust. The lubricant used was solid paraffin, and the final product contained between half per cent and two per cent of solid paraffin. The men in question were between 25 and 49 years of age, and they usually got their symptoms after a few years' exposure. These cases are presented by courtesy of Dr. O. Nordenfelt.

Case No. 1: The man in question is 49 years of age and was subjected to 13 years' exposure. The first symptoms, dyspnoea at effort, were noticed after twelve years' exposure. His symptoms are only slight and the lung function is normal. X-ray shows fine nodulation in the upper lobes of the lung.

Case No. 2: This is the case of a man, 25 years of age, exposed for 2-1/2 years. The first symptoms were noticed after two years. He has some signs of impaired lung function, but normal residual quotient. X-ray shows nodulation of mostly the upper parts of the lung.

Case No. 3: This deals with a man 35 years of age, exposed for three years, and after that time he got some symptoms of dyspnoea at effort.

After those three years he was transferred to another job where he was not subjected to dust exposure. Lung function was normal. X-ray shows nodulation mostly of the upper parts of the lungs. X-ray of the same man three years' later shows about the same picture.

Case No. 4: A man 40 years old, exposed for 4-1/2 years. The first symptoms were dyspoena at effort after four years. X-ray shows nodulation of the upper and emphysema of the lower part of the lungs. He was taken away from the exposure after 4-1/2 years, and at the end of another three years, he was x-rayed, which shows some progression of the emphysema. The man still had some symptoms and showed now signs of impaired lung function.

These men have not previously been exposed to any other dust. The concentration of silica, probably as silicate, in the dust was very low and would not cause pneumoconiosis; neither would the lubricant be of any significant importance. Thus, this pneumoconiosis was probably produced by inhalation of aluminium dust.

Koelsch of Munich

Koelsch describes what the authors consider a definite characteristic picture of aluminum dust poisoning in men working in an atmosphere of finely divided silica particles. The symptoms consist of short breath, lessened vital capacity, stabbing pains in the chest, slight cough and expectoration. The special features all note is the youth of the victims (older men are less susceptible), the shortness of exposure, the rapid course of the disease, and the fact that the process may progress after exposure ceases. Two cases of pneumothorax are described, attributed to great increase of intra-alveolar pressure, the aluminum dust impeding expiration. Two autopsies are described, the findings in which agree strikingly; extensive interstitial pneumonia with induration and shrinking. The interstitial tissue had undergone hyaline-collagenous degeneration. One author speaks of a filtery, metallic sheen on the cut surface of the lung. According to Koelsch, there was an abnormal dust exposure in these factories, caused by wartime conditions, the lack of proper exhaust, the obstructed windows, necessitated by the blackout.

Ivanova, M.G. and Ostrovskaya, I.S., Action of Aluminum Dust on Animal Organism. Gigiena i Sanit. No. 4: 21-27, 1950, Russian

In experiments with rats and rabbits, involving either inhalation of aluminum dust, its introduction into tracheae in physiological-solution

suspensions or intravenous injections of such suspensions, it was clearly shown that an "Aluminosis" results; this is a form of respiratory disease, involving malformations in the respiratory organs which progress even after termination of administration of the dust. Pathologic changes in the kidneys and occasionally in other organs were also found. The use of aluminum dust against silicosis is therefore highly questionable.

FILE COPY

F.W.F
6/20/9

June 13, 1951

Dr. A. J. Lanza, Chairman
Institute of Industrial Medicine
New York University-Bellevue Medical Center
477 First Avenue
New York 16, New York

Dear Tony:

Here is a copy of a letter of June 6 from Dr. Anderson to Mr. Westmant on aluminum prophylaxis. Along with his letter is attached a Russian article on this subject and a pamphlet by Drs. Brown and Van Winkle that is reprinted from the Journal of the American Medical Association, July 23, 1949.

I have read the highlights of the Russian article and the pamphlet. My lay mind has received very little light therefrom, except to note in the pamphlet the observation that aluminum is apparently not harmful to the normal and silicotic human lung in the dosages given for therapy and prophylaxis of silicosis. Perhaps Andy sent you this same information or, more likely, you have already seen it, anyway.

I shall be interested in having any comments you wish to make.

Sincerely yours,

J. P. Woodard

Enclosures-3

bc: A. S. Eisenhast
H. M. Jackson

Mr. F.F. ... may be opened. Andy opened with him the hope had little significance.
C 6/15

0

D

Lompoc Plant
June 6, 1951

O. B. Westmont - Plant Manager

Aluminum Prophylaxis

In reviewing the literature on aluminum prophylaxis, I have succeeded in obtaining copies of the Russian article, "Action of Aluminum Dust on Animal Organism", by M. G. Ivanova and I. S. Ostrovskaya, and "Present Status of Aluminum in the Therapy and Prophylaxis of Silicosis", by Ernest W. Brown, M.D., and Walton Van Winkle, M. D. I believe everyone interested in this subject should read these two articles, paying particular attention to the article by Brown and Van Winkle. This article answers so many of the questions that we have discussed at great length. I will be glad to receive any comments you care to make.

W. M. Anderson, M. D.
Plant Physician

WMA:ae
enc. 2
cc and enc. 2
A. S. Eisenbart - DHQ
J. P. Woodard - GHQ
H. M. Jackson - GHQ

FILE COPY

File
6/20

June 13, 1951

Dr. A. J. Lanza, Chairman
Institute of Industrial Medicine
New York University-Bellevue Medical Center
477 First Avenue
New York 16, New York

Dear Tony:

Hugh Jackson, Arthur Kissenbest, and I read with much interest Skip's letter of May 31 to you written from Johannesburg about aluminum therapy. Arthur suggests that copies of this be sent to Mr. Westmont, Dr. Smart, Dr. Anderson, and Dr. Cummins.

The letter is in some respects a rather personal one to you, so I didn't want to send it out to them, but would prefer that you send it to them in its entirety or, if you think it advisable, the important excerpts that bear on the subject under discussion. I like some of the humor in the letter, which is entirely foreign to the subject under discussion, so if you think it appropriate, I think most of these fellows would enjoy reading the whole letter.

I shall be interested in seeing you soon and learning of your talks with Dr. Anderson and Dr. Smart at the Atlantic City meeting.

Sincerely yours,

J. P. Woodard

Tony says Reg. & Anderson have them.
Give send returns.

F.U.
~~6-22-51~~

June 13, 1951

M. E. Payans, Treasurer
Great Lakes Carbon Corporation
18 East 48th Street
New York, N. Y.

Dear Mr. Payans:

We received today from The Trudeau Foundation, Saranac Lake, N. Y., a bill in duplicate, dated June 1, amounting to $2,625, billing us for their research services on "powdered aluminum hydroxide in diatomaceous earth pneumoconiosis" for the 3-month period, February 15 to May 15. I am enclosing copy herewith.

This program was discussed at the meeting which Mr. Tellefsen and you attended here on February 13, and was covered by Saranac's Proposal of October 6, 1950, of which you received a copy, except that it was later modified to include finely ground aluminum oxide, as well as the powdered aluminum hydroxide originally contemplated.

You have been kept informed of all developments in this matter subsequent to the February meeting and have indicated your willingness to participate in the program and share the expense by underwriting one-third of it to our two-thirds, which is the same basis on which work done heretofore by Saranac was shared between us.

The cost estimate given us by Saranac for the full year's work was $10,500. Accordingly, your share would be $3,500 to our $7,000. Your quarterly payments would be at the rate of $875, and since the work did not start until February 15, only three of the payments would fall due in the current year, and the fourth sometime in 1952.

It would facilitate matters if you would make your check payable to The E. L. Trudeau Foundation, Fiscal Department, Trudeau, N. Y., instead of to Johnsonville, but send it to us and we will forward it with our check for the other two-thirds of the bill to Saranac. In due course you would receive an acknowledgement from them.

Yours very truly,

J. F. Woodard

FILE COPY

June 21, 1951

Dr. A. J. Lanza, Chairman
Institute of Industrial Medicine
New York University-Bellevue Medical Center
477 First Avenue
New York 16, New York

AJL Lanza 7/12
[illegible]

Dear Tony:

These are the questions on which we are still waiting for answers from Art Verweld. We have followed these up, but have not received any replies, except for the attached copy of Art's letter to me of June 18, which I presume is intended as an answer to the first question, but which does not prove a high incidence of tuberculosis at Lompoc.

(1) My letter of April 16 - What information is there that would indicate the high incidence of tuberculosis at Lompoc?

(2) My letter of April 16 - What program do you propose that we undertake to determine to what degree cortisone causes a resolution of lung fibrosis, i.e., diatomaceous earth fibrosis?

(3) My letter of April 16 - When could you send me a couple of copies of the report on the meeting in Australia which listed the eight cases in Holland where there had been lung damage by aluminum?

(4) My letter of May 3 - What do you suggest as to tests on tuberculin-treated pigs to determine whether or not aluminum therapy has any effect on a superimposed diatomaceous earth powder condition?

[illegible] 7/12

See (4) Do with [illegible]

You said that, when you go up to Saranac next week, you would discuss these questions with Art.

We would be interested in knowing what the answers are.

Sincerely yours,

J. P. Woodard

Enclosure

bc: H. M. Jackson

J.P.W. +

ACTION OF ALUMINUM DUST ON ANIMAL ORGANISM

BY M. G. Ivanova and I. S. Ostrovskaya

From the Laboratory of Pathomorphology of the Ukraine Central Institute of Hygiene of Industrial and Professional Diseases. Reported in the Session of the Commission for the fight against silicosis in Charkov, 1/11/49, from Hygiene and Sanitation, April 3, 1950, Moscow.

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In spite of numerous publications on questions of treatment, pathogenesis and prevention of silicosis, there are still many important questions in the problem of silicosis that are not yet studied, in particular the research of the influence of inhalation of aluminum dust in prevention and treatment of silicosis.

Canadian writers, Denny, Robson, and Irving, have published during 1936-1939 their observations showing that the dust of metallic aluminum lowers the solubility of quartz dust and prevents the action of silica in the lungs of tested animals. As a result of their successful experiments these writers offered in 1943 prophylactic inhalation of aluminum in order to prevent silicosis. Later Robson also offered treatment of workers sick with silicosis by aluminum inhalation. The lack of clinical observations over a lengthy period of time of patients who received treatment of aluminum inhalation makes us doubt the validity of the Canadian writers' suggestion. The haste of popularization of a method, which was not studied and tested long enough, and the material interest of Canadian writers, gives the impression of commercial business and not of scientific work. A very grave drawback in this method of alumino-prophylaxis and therapy is the impossibility of establishing a more exact dosage of the medicine necessary for prevention and treatment of silicosis. Even if we grant that 1% aluminum dust added to silica would prevent its solution, we cannot decide offhand the question of this dosage for prevention and treatment of silicosis. Therefore, the assertion of these Canadian scientists about the harmlessness of aluminum dust for animal and human organism needs careful verification.

The decreasing solution of silica in the organism, when it is treated by metallic aluminum dust, depends upon the formation of colloidal film of hydroxide of aluminum covering the particles of silica. In Hardner's tests the metallic aluminum was less effective than its gelatinous hydroxide. But for better effectiveness it is necessary that the hydroxide of aluminum and silicon should be in close contact, contained in the same cells. How far from actual life are such conditions! Hardner's tests of the use of aluminum hydroxide in silicosis give an incomplete effect because the illness could still progress.

Not mentioning the fact that in America and in other countries there is expressed a doubt in the effectiveness of alumino-therapy (Lane, Berry), we think the assertion of the above Canadian scientists about the harmlessness of aluminum dust for the organism contradicts the pharmacological data.

It is known that intravenous injection into the blood of aluminum has an anti-toxic action, paralysing the central nervous system and the heart: it is noticed that the animals have then a trembling of the head, cramps, diminution of sensations, and other symptoms of progressive paralysis of the central nervous system.

Aluminum, introduced into the blood and under the tissue of animals, is being excreted by kidneys and intestines. Dr. Kassilsky Skoorsor notes a very slow progress of similar pathological changes under the influence of aluminum. Consequently there is a possibility that aluminum introduced into animal organism, interacting with the component parts of tissue liquid and blood plasma, can cause sedimentation, thickening, and coagulation of albumin. These observations are confirmed by Yegar's tests, on colloidal chemical reaction of aluminum ions, causing coagulation of tissue liquid. We can add to this that there are indications of outbreaks of tuberculosis process under the influence of aluminum dust and that workers in aluminum industry have been found to have noticeable changes in lungs with spontaneous pneumothorax complications (Goralevsky, Kalgn). Therefore, the problem of study of the influence of pure aluminum dust on the organism offered as a prophylactic and therapeutic remedy against silicosis becomes one of real concern.

When?

In connection with the above, we made an experimental study on animals (white rats and rabbits) to determine the action of aluminum dust. In our work we used three methods: (1) Introduction into the trachea of a weighed quantity of aluminum dust in physiological solution. (2) Intravenous introduction of the same amount of aluminum dust. (3) Dusting the air of the animal room with aluminum dust.

The tracheal method was used on rats only; the intravenous on rabbits only; the air dusting to both of them. The total amount of animals used in the test was 84: 54 rats and 30 rabbits.

We took for this test finely ground dust of pure metallic aluminum recommended for prophylactic inhalation. The size of each dust particle did not exceed 2 microns. Preliminary tests on rats were made by introducing the weighed dose of metallic aluminum in physiological solution into the trachea. 0.01 gr. of aluminum dust was dissolved in 3 cubic centimeters of physiological solution, the liquid was well shaken and 0.1 cubic centimeter of it filled into a syringe. (The aluminum dust was preheated and the physiological solution sterilized.)

The very first tests gave already such a clear and characteristic picture of pathological changes in lungs that the theory of harmlessness of introducing aluminum dust into animal organisms could be rejected at once. A rat, killed three months after the introduction of aluminum dust into its trachea (dosage - 0.0003), had numerous dark spots, round in shape, mostly located at the ends of bronchial branches. (See: Fig.1) Most of these knots were pierced by fibrous bodies in spots considerably thickened because of hyalinosis; among them there was found an empty fibrous hyalinized vessel. We noted that pure metallic aluminum dust produced fibrous thickening with hyalinosis not only in spots where dust was collected but also beyond these limits.

These first data, obtained from the rough test of introduction of aluminum dust into the trachea showing pathogenesis in animal organism, required further study.

Questions arose: What are the initial changes in lung tissue in air dusted with aluminum? What cells and in what measure phagocyte aluminum dust? What is the further fate of phagocytes dust? Does the dust move in lymphatic vessels in the lungs into the lymphatic nodes? What is the pathogenesis of fibrous reaction? Does the aluminum dust influence the entire animal organism and what organs are impaired besides the lungs? Finally, what affected area is the most essential for professional pathology study?

141.5 mppcf

The second group of rats was placed into an aluminum air dusted room for eight hours daily. The dust content approximated 5,000 dust particles per cubic centimeter.

The third group of rats had the same dosage of air dust only for thirty minutes daily. The total number of tested rats was thirty-nine. Part of them were left for the maximum period of survival, the remainder killed two at a time at different intervals after systematic air dusting, and some were taken out of the room after certain periods of dusting and later killed.

In fifteen days, rats which stayed in aluminum air dusted rooms for eight hours showed an accumulation of dust cells in alveolae and alveolar walls, oftenn entirely covered by black dust entirely obstructing the nucleus, wide lymphostasis with the addition of lymphocytes around vessels in perilobular walls and in sinuses of lymphatic nodes. The latter contained a small amount of dust in scattered reticular cells.

Rats, killed after 2-3 months, had similar changes with a pronounced fibrous thickening of interalveolar walls.

Still further changes were noted in rats submitted to the air dusted room eight hours daily during three months. These rats were then moved into a clean room for three more months and then killed.

The whole test lasted six months. (2 microphotos follow) Figure I with a caption: Aluminum dust among fibrous tissue in a rat's lung. The rat was killed three months after introduction of aluminum dust into the trachea. Figure II: Vesicular emphysema with interstitial fibrosis in a rat's lung. After three months aluminum air dusting and killed three months later after the termination of the test.

Rats which stayed in aluminum dusted rooms for thirty minutes only during one to two months showed fibrous thickening of pleura, interalveolar fibrosis and hyalinosis of alveolar walls. Sometimes near pleura there occurred a distinct perilobular interalveolar and perivascular fibrosis of considerable size, noticeable enlargement of fibrous tissue between the muscles in bronchial walls. In lymphatic nodes interstitial and perivascular fibrosis and a small accumulation of dust in the sinuses.

Similar changes and a still more pronounced reaction were observed in a rat submitted during two months for thirty minutes daily to the action of aluminum air dusting and killed a month after the end of the test: a rough knotty interstitial peribronchial fibrosis with hyalinosis, bronchiectasis far beyond the dust concentration, thickened interalveolar walls with hyalinosis in the dust area.

Thus, rats in the aluminum dusted room and rats with aluminum introduced into the trachea showed absorption of aluminum dust by the walls of alveolar epithelium up to interalveolar walls, which meant deep penetration of large amount of dust into the lungs. Besides this, in the beginning (15 days) we observed large lymphostases greatly obstructing the passage of dust by lymphae, clogged by dust walls and pressed because of dust deposit in alveolae.

Almost a complete absence of dust in lymphatic nodes proved that the back flow was hindered and that most part of the dust remained in the lungs. We noted that there was no inflammatory reaction, almost no polinuclei, and at the same time quick fibrous thickening often with hyalinosis of the connective tissue, interalveolar walls, vascular walls, bronchial perilobular walls, pleura and homogenisation of protoplasma. These changes were noted not only in the area of dust concentration, but also beyond it. Symptoms of sclerosis were present at the end of the test.

Similar tests were made on rabbits. Twenty-two rabbits were used, fourteen of which were submitted to the action of aluminum air dust for eight hours daily and eight for thirty minutes daily with equal amount of dust, averaging 5.000 dust particles per cubic centimeter. We observed during the first 7-15 days lively action of lung phagocytes absorbing aluminum dust. In bronchi, among the liquid-free dust and dust cells, separate groups of alveoli with fibrous thickening of walls, on the periphery in spots vesicles of emphysema (Figure II) in bronchial proliferation of layers of bronchial epithelium, which together with lumps of dust and with a large number of dust cells obstruct the lesser bronchi.

In connection with the above, there were mostly under the pleura vast areas of atelectasis of lung tissue with proliferation of alveolar epithelia and accumulation of dust cells in narrowed alveoli.

In longer periods of dusting (3-5 months) all the above changes increased. The data about pathological changes in lungs of rabbits differ somewhat from those in the rats. We noted a bronchial process and a more pronounced change in albumin of blood plasma, a sulphuric deposit in alveoli and bronchi, leading to thickening and coagulation up to hyaline transformation. This peculiar pathology of the paraplastic substance of albumin of cellular protoplasma and blood plasma was the result of chemical reaction of aluminum. Easily soluble aluminum produces its tying effect, as a result of which we saw condensation, coagulation, and clotting of albumin masses. This was confirmed by the absence of inflammatory process in the dust concentration area. The development of fibrosis and hyalinosis was not the result of inflammation and the ensuing infiltration and exudation process.

These hystological changes indicate conclusively the characteristic pathological process of albumin coagulation under the specific chemical reaction of aluminum. The resulting block in vessels and capillaries, the emptying of interalveolar walls, the fibrous thickening of vascular walls and bronchi lead to grave secondary changes in lungs, which could be considered as a complication following "aluminosis". Such are numerous lymphostases in early periods, characteristic pneumonia often causing death in tested animals.

Out of twenty-seven tested rats we noted in thirteen gradual loss of weight, ending in cacheria, at first visibly increased breathing ending by irregular and slower breathing.

At the autopsy in microscopical tests we noted localized hemorrhagic pneumonia of "white" pneumonia almost in the whole lung, filling by its size the whole half of the chest.

It is clear that with such important changes in lungs we could expect, to some extent, changes in other organs due to the chemical reaction of aluminum.

Regardless of the method of introduction of aluminum dust, we observed in most animals some pathological changes in kidneys, more seldom in the heart and other organs, but as a rule there was always damage to the connective tissue.

The most conclusive results were produced by the tests with intravenous injections of aluminum dust. For these tests we used eight rabbits. We injected to all of them daily into the ear lobe vein 0.05 g. of aluminum dust in 4 cubic centimeters of physiological solution during a thirty day period, total amount 1.5 g. of aluminum dust.

This amount, injected into a rabbit during thirty days, lead to very important changes, progressing with time, in many organs in spite of dust absorption by the reticulo-endothelial system.

They underwent changes similar to lung phagocytes; the cell protoplasma became dense, fuchsinophylic; the cells of reticulo-endothelial system, fusing with each other became gigantic multinuclear cells.

We think that the thickening of connective tissue in all organs and in lungs which was visible even where there was no trace of dust, together with the progressing process even after the end of the test, indicates a chemical reaction of aluminum dust on animal organism.

The process of thickening of paraplastic substance, influenced by albumin, could be compared to the progress of sclerosis in old age. This applies in equal measure to the heart condition. It is a pathological aging of the whole organism.

As a result of tests conducted to determine the action of aluminum dust on animal organism (rats and rabbits), we came to the following conclusions regardless of the method of introduction of aluminum dust we established a quick appearance of pathological changes (starting from the 15th day) in lungs and other organs. Important changes in the structure of lung tissue and bronchial walls, extended fibrosis with hyalinosis in connective tissue, large emphysema, bullous peripheral emphysema, hemorrhages are the background on which often appear abscessed bronchi-ectases and hemorrhagic pneumonia.

These changes are the result of chemical colloidal action of aluminum causing coagulation of albumin. This is characteristic of the process.

Pathological changes in lungs under the action of pure aluminum dust are specific and could be called a type of pneumoconiosis--"aluminosis". This upsets the theory of harmlessness of aluminum for animal organisms and also the assertion, up to now seemingly unquestioned, that there could be no pneumoconiosis without a large quarts amount in the system.

The action of aluminum dust is not restricted to local damage of lung parenchyma. To a certain extent the process of fibrous thickening with hyalinosis is distinct in blood vessels up to fibrous emptying in spots, damage in kidneys, starting with almost invisible thickening of capillary walls and connective tissue of kidneys and ending by the shrinking of these.

A small amount of dust was also found in the spleen, in kupfer cells of the liver, which indicates the possibility of spreading dust particles and formation of hydroxide of aluminum in a hematogenic way. The fibrous thickening of connective tissue was found in different degree in the heart tissue, in vessels in the spleen, in the liver, and in the brain tissue.

The most vivid picture of pathological changes was obtained in intravenous injections of aluminum dust. We must stress that the fibrous thickening of connective tissue appeared very early in the test (on the 15th day) and progressed even after its termination.

Our conclusion follows:

1. Aluminosis, produced by the action of pure metallic aluminum, is a new type of pneumoconiosis which must be considered among industrial diseases caused by dust.

2. The use of aluminum as a prophylactic and therapeutic remedy against silicosis demands further careful and serious experimental and clinical study.

3. It is necessary to organize a careful health observation and control of workers occupied in aluminum work.

4. It is necessary to improve technical and sanitary conditions and take measures against air dust for a successful fight against silicosis in mining and other industries.

Translated by Mrs. Schneyeroff,
Virus Lab., May, 1951.

June 13, 1951

A. S. Elsenbast

Aluminum Therapy

Inasmuch as Hugh Jackson has a copy of Skip's letter of May 31 to Dr. Lanza, I am using that for our record and sending you the other copy for your own use.

I have suggested that Tony send out the copies as recommended by you. Since the letter is in some respects a personal letter to him, I thought he would like to do it.

J. P. Woodard

enc

J.F.W.-

The attached bill from The Trudeau Foundation was received in this morning's mail.

I have checked their Proposal of October 6, 1950, and it shows that the total cost estimate for this work in 1951 was $10,500. One-quarter of this would be $2,625.

In our budget for 1951 we included an item of $17,000 for "Services of Non-employees" the bulk of which was for work to be done at Saranac, both on powdered aluminum hydroxide in connection with Diatomaceous Earth, and on Asbestos. Accordingly, we have funds to cover this and subsequent bills from The Trudeau Foundation.

In Minutes of a meeting held at GHQ, February 13, 1951, at which Mr. M. E. Puyans was present, the following was recorded under "Conclusions": "Mr. Puyans indicated that Great Lakes Carbon Corporation would participate in the aluminum therapy program if their consultant medical opinion was in agreement."

Dr. Smart, in a letter dated March 1, 1951 to Dr. Lanza, said: "I am very enthusiastic about some qualified laboratory undertaking experiments with aluminum in combination with flux-calcined D.E." I do not find any acceptance in writing from Great Lakes Carbon of the proposal that they underwrite one-third of the aluminum therapy program to our two-thirds, but they have been participating in everything that has been done thus far.

One-third of this bill would be $875. Some months ago, Great Lakes Carbon sent us their check, made out to Trudeau Foundation, which we forwarded to Trudeau with our own check, on a 1/3rd - 2/3rds basis, for continuation of the research program with Diatomaceous Earth. More recently, however, when we suggested they follow the same method in paying the bill for Dr. Lanza's expenses on the trip to California, they made out a check for their share payable to J-M instead of making it payable direct to Dr. Lanza.

J.R.H.

THE TRUDEAU FOUNDATION

FOR THE CLINICAL AND EXPERIMENTAL STUDY OF PULMONARY DISEASE

SARANAC LABORATORY
TRUDEAU LABORATORY
TRUDEAU SCHOOL

June 1, 1951

DEPARTMENT OF BIOCHEMISTRY
DEPARTMENT OF PHYSIOLOGY
DEPARTMENT OF RADIOLOGY

IN ACCOUNT WITH

Johns - Manville Corporation
22 East 40th Street
New York 16, N. Y.

Attn: Mr. J. P. Woodard

Research services, "Powdered Aluminum Hydroxide in Diatomaceous Earth Pneumoconiosis", for 1st quarter, February 15, 1951 to May 15, 1951, per terms of proposal dated October 6, 1950 and approved January 23, 1951 at annual rate of $10,500.	$2,625.00

PLEASE REMIT TO: THE E. L. TRUDEAU FOUNDATION, FISCAL DEPARTMENT, TRUDEAU, NEW YORK

THE TRUDEAU FOUNDATION

FOR THE CLINICAL AND EXPERIMENTAL STUDY OF PULMONARY DISEASE

June 1, 1951

SARANAC LABORATORY
TRUDEAU LABORATORY
TRUDEAU SCHOOL

DEPARTMENT OF BIOCHEMISTRY
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PLEASE REMIT TO: THE E. L. TRUDEAU FOUNDATION, FISCAL DEPARTMENT, TRUDEAU, NEW YORK

General Headquarters
June 7, 1951

A. S. Eisenhart

Ind. Hygiene — Dist. Earth

Connaught Laboratory

On May 21, I met with Drs. J. G. Cunningham, F. M. R. Bulmer, and C. M. Jephcott, and Mr. Johnston of the Industrial Hygiene Division of the Department of Health, Province of Ontario.

The following are the principal points of our discussion:

1. The Connaught Laboratories are housed in the University of Toronto buildings and are a part of the Public Health School of that organization. The faculty is provided by the Provincial Department of Health (Dr Cunningham, et al) and its facilities are available to the Department of Health.

2. The facilities for animal dusting are small and, for the last two or three years, there has been no qualified laboratory technician on the university staff. Jephcott and Johnston used the facilities for a portion of the work reported in their paper "Solubility of Silica and Alumina". There are, however, neither the facilities nor personnel available for research of the type we are desirous of having performed.

3. The J-M diatomaceous earth material used by Jephcott and Johnston was obtained through the Ontario sales office. They were interested in the fact that our research department solubility tests had yielded results approximating theirs.

4. Dr. Cunningham was not convinced of the value of aluminum prophylaxis as a control of silicosis. Their industrial engineering laboratory performs lung analyses following all silicotic deaths, and Dr. Jephcott's comment was to the effect that there has been no noticeable decrease in the number of lungs that have been received, and, assuming that aluminum treatment is effective, another ten years would be necessary to properly evaluate it. Mr. Johnston was the only one who was enthusiastic about aluminum therapy. (His background includes a number of years' work in the Banting Institute.)

Dr. Jephcott, on the basis of his experimental work with our materials, had come to the opinion that the flux-calcined material was sufficiently toxic to warrant controls equivalent to those required for free silica exposure. He requested that we advise him of the principal uses of this material in Ontario in order that the Department of Industrial Hygiene might make engineering recommendations for its control.

H. M. Jackson

cc. J. P. Woodard
C. W. Hite

June 5, 1951

Mr. Woodard:

Dr. A. J. Vorwald called - is in New York today for a Trustees' meeting.

Said he will answer your several letters next week when he returns to Saranac.

He will call again this afternoon on the chance that you may be here, and expects to return to New York on his way back to Saranac about Monday or Tuesday of next week, and if he has an opportunity, will call you then.

D. M. H. 10:30 a.m.

THE TRUDEAU FOUNDATION
FOR THE CLINICAL AND EXPERIMENTAL STUDY OF PULMONARY DISEASE

SARANAC LABORATORY
TRUDEAU LABORATORY
TRUDEAU SCHOOL

OFFICE OF DIRECTOR
P. O. BOX 581
SARANAC LAKE, N.Y.

DEPARTMENT OF BIOCHEMISTRY
DEPARTMENT OF PHYSIOLOGY
DEPARTMENT OF RADIOLOGY

May 16, 1951

6/7

Mr. J. P. Woodard
Johns-Manville Corporation
Twenty-two East Fortieth Street
New York 10, New York

Dear Mr. Woodard:

Your letter of May 14 to Doctor Vorwald has been received in his absence while attending the American Mining Congress in Cleveland and the NTA meetings in Cincinnati. He will return to the Laboratory on Monday, May 21, which is the last week of our Trudeau School and which is to be devoted to Pneumoconiosis. That will be a busy time for Doctor Vorwald, as you will appreciate, I am sure.

Your several letters will be brought to Doctor Vorwald's attention and I know that he will answer them as soon as he has an opportunity.

Best wishes from all of us.

Sincerely yours,

Lillian R. Blinn

Lillian R. Blinn (Mrs. A.B.)
Executive Secretary to -
Arthur J. Vorwald, M.D.
Director

LB

File Copy

5/24

May 14, 1951

Dr. A. J. Vorwald, Director
The Saranac Laboratory
P. O. Box 551
Saranac Lake, New York

Dear Art:

Here are some questions that recently came up and were posed in letters to you, and I wonder if you can give me the answers to them:

(1) My letter of April 16 - What information is there that would indicate the high incidence of tuberculosis at Lompoc?

(2) My letter of April 16 - What program do you propose that we undertake to determine to what degree carbicone causes a resolution of lung fibrosis, i.e., diatomaceous earth fibrosis?

(3) My letter of April 16 - When could you send me a couple of copies of the report on the meeting in Australia which listed the eight cases in Holland where there had been lung damage by aluminum?

(4) My letter of May 3 - What do you suggest as to tests on tuberculin-treated pigs to determine whether or not aluminum therapy has any effect on a superimposed diatomaceous earth powder condition?

I thought my listing these separately in this fashion might make it easier for you to check up on them and give us some answers.

Yours sincerely,

J. F. Woodward

bc: H. M. Jackson

~~File Copy~~

Draft
Hold to ... OK
do 5/29

FILE COPY 5/23

May 14, 1951

Dr. A. J. Lanza, Chairman
Institute of Industrial Medicine
New York University-Bellevue Medical Center
477 First Avenue
New York 16, New York

Dear Tony:

It is my recollection that Reg Smart said that intratracheal injections of aluminum dust and diatomaceous earth dust in guinea pigs would be sufficiently convincing as to whether the combination is or is not particularly toxic. I think it is correct that Reg suggested this as a means of getting an answer to this in a relatively short time, i.e., the degree of toxicity.

In my layman's language, I tried to get this point over with Art Vorwald when we were there, but did not get the situation clearly understood. I believe his thought was that this would not give the answer we want.

If it isn't too much trouble, would you kindly review this with Reg Smart, if you think such a review is necessary, or in some other fashion suggest to me precisely what should be done about this. If we should do it, I want to do so, and as long as Reg is one of those who feel this would prove the point, I am particularly of the opinion that something should be done to settle it.

I am sure you know what I am driving at. How can I get this point over?

Yours sincerely,

J. P. Vanduzer

6/15/51 Tony ... told him to go to ... and find out what expected results of

bc: H. M. Jackson

1. Intraperitoneal injections - diat. earth + aluminum -
(a) any harm?
(b) any signs of protection?
2. Intratracheal - same info.

(OVER)

FILE COPY

May 3, 1951 5/11

A. S. Eisenbast

Industrial Hygiene - Lompoc

You mentioned that O. B. Westmont would be in New York the week of May 7 and would be available for a meeting on Friday, May 11.

As we agreed, I checked with Dr. Lanza to see whether he would be agreeable to sitting in with the three of us for a brief discussion of industrial hygiene problems at Lompoc.

Dr. Lanza will be available that day and said he would plan to be here at my office at 3:30 on Friday afternoon, May 11.

This note is just to let you know about this so that you can tell Westy when he gets here.

J. P. Woodard

cc: A. J. Lanza, M. D.

CONFIDENTIAL

Lompoc Plant
May 4 1951.

AIR MAIL

A. S. Eisenbast, DHQ Box 91

Aluminum Therapy

During our discussion of this subject, with Dr. Anderson, you asked me to write to you regarding the addition of TB infection tests in connection with the Aluminum treatment program, being carried out at Saranac.

It was agreed that this work should be done concurrently with that covered in the report previously prepared by Dr. Vorwald.

O. B. Westgaard

cc J.P.Woodard, DHQ Box 91

file

File 5/21

May 3, 1951

Dr. A. J. Verwald, Director
The Saranac Laboratory
P. O. Box 551
Saranac Lake, New York

Dear Art:

When Mr. Eisenbast was recently in Lompoc, it was agreed in a discussion which he, Dr. Andersen, and Mr. Westmont had that it would be helpful if there were sufficient tests on tuberculosis-treated pigs to determine whether or not aluminum therapy has any effect on a superimposed diatomaceous earth powder condition.

In the main test you are running on diatomaceous earth, there are certain tb animals. However, in the aluminum therapy test as established, there are none.

Would you kindly suggest to us how you could most easily make the tests indicated above, when you could do it, and how much it would cost?

Yours sincerely,

J. P. Woodard

Copy to: A. J. Langa, M. D.
A. S. Eisenbast

cc: HMJ (6/29/51)

Confidential

FILE

5/1

5/28

May 3, 1951

A. S. Elsenbast

Industrial Hygiene - Lompoc
Yours of April 24

In order to refer to your letter more readily, my comments below refer to paragraphs by number, beginning with 1 as the paragraph starting out, "The writer advised the group . . . ."

Jim ?

✓ Paragraph 3 - I am checking with Dr. Vorwald to see how he would propose to carry out the tests on tuberculosis-treated pigs to find out whether aluminum therapy has any effect on a superimposed powder condition. F.U.

✓ Paragraph 4 - There has up to now been no report published on the McIntyre project other than the information the McIntyre people have for their own records. The Province of Ontario has undertaken to write up the experience for the Province as a whole. This would include McIntyre and other companies as well. The various companies are presumably cooperating with the Province in supplying information for the publication. The date of publication is not now known. X

Paragraph 7 - It is assumed Dr. Anderson, after his discussion with Dr. Smart, will give all of us the information about the X-ray evidence at Terrebonne and the Basalt plant of GLCC, also the story on the Eagle-Picher Elko, Nevada, plant. F.U.

I believe these notes cover the points in your letter that require some action on our part.

J. P. Woodard

cc: O. B. Westmont, Lompoc
W. M. Anderson, M. D., Lompoc

bc: A. J. Lanza, M. D.

AJL: If you have any comments, please let me hear from you.

JPW

Lompoc Plant
April 24, 1951

AIR MAIL
CONFIDENTIAL

J. P. Woodard, GHQ, Box 91

Dr. Anderson, Mr. Westmont, Dr. Cummins and the writer, reviewed the present status.

The writer advised the group of our recent discussion at Saranac, which included the
1 advice that we have asked Dr. Vorwald for an estimate and program for the use of cortisone in conjunction with aluminum therapy.

The major item at issue was what Messrs. Westmont and Anderson wanted to do about aluminum therapy here at the Plant. Dr. Anderson emphasized the fact that he should be
2 consulted in the formulation of any research program on this subject, and was assured that he was in position to submit any recommendations and items at any and all times, and both Dr. Anderson and Mr. Westmont were assured that every program, to be carried out on this subject, would be submitted to them for their approval, recommendations, etc.

In this connection, on the program which is to be carried out at Trudeau on aluminum therapy, Dr. Anderson requests very definitely, and we agree with him, that there should
3 be included, if there is not any, sufficient tests on tuberculosis treated pigs to determine whether or not aluminum therapy has any effect on a superimposed powder condition. We agreed that this should be done.

Dr. Anderson's attitude regarding aluminum therapy was that he was not against it, but he was not for it, account of lack of sufficient technical information on the subject.
4 Certainly we all agree that there is no background for aluminum therapy, as presently known, with Diatomite. I agreed that we would definitely find whether or not there has been an interim report on the McIntyre project (since its inception) published.

Dr. Anderson also states that there are several authorities in this field, i.e. Sanders
5 and Williams, who have been against aluminum therapy, and he felt we should interview these men to find exactly why they are opposed to aluminum therapy.

I gave the group Dr. Vorwald's opinion, received on our April trip to Saranac, that the
6 natural powder was in a much less dangerous class than the flux calcined and special flux calcined powders.

Dr. Anderson will discuss, with Dr. Smart, the question brought up by Mr. Tellefsen on the status of X-rays on individuals at Terrebonne, where it is reported that no instances
7 of any kind have occurred during the last fifteen year period, likewise Dr. Anderson will further ascertain whether Dr. Smart has any information on the X-rays taken in the Great Lakes Basalt Plant as well as Eagle Picher Elko plant.

During the discussion, Dr. Anderson stated that no new massive cases had occurred within last several years, but that a progressive linear fibrosis had occurred in several cases.
8 He felt greatly concerned in regard to the susceptible than the normal and that such lung changes prevented treatment for such infection responding in the normal manner. This was the opinion expressed by Dr. Smart in the case of Romero.

It was agreed that Messrs. Westmont and Anderson would advise with us within the next
9 several weeks just what they would like to do in the starting up of the aluminum therapy.

A. S. Elsenbast

cc O. B. Westmont, Lompoc
W. M. Anderson, "
File (AE)

Wilton L. Halverson, M. D.
Director of Public Health

April 19, 1951

Herbert K. Abrams, M. D.

Status of Aluminum in Silicosis and Diatomaceous Earth Pneumoconiosis -- a Summary.

1. Metallic aluminum and aluminum oxide were first suggested (1937) for the prophylaxis and therapy of silicosis after it was reported that aluminum decreased the solubility of silica in vitro and protected rabbits against silicosis.

2. On the basis of these reports, aluminum inhalation was instituted for both prophylaxis and treatment of silicosis in a number of industries, notably certain mines in Canada.

3. All reports of beneficial results obtained in human beings, to my knowledge, have been characterized by two features: (a) no control subjects, or inadequate controls have been used; (b) the majority of treated subjects have reported subjective improvement but there has been no convincing evidence of objective improvement as measured by pulmonary function or roentgen ray.

4. In the one report of a controlled study of aluminum therapy of which I am aware, there was no difference in results demonstrated as between treated or control subjects.

5. No statistical data have been published, to my knowledge, which would support the claim that aluminum prophylaxis has been effective. There are known to be cases of miners with history of previous silica exposure who have shown roentogenologic progression despite aluminum administration.

6. No evidence has been published in America to show that aluminum in the amounts given for prophylaxis or therapy is harmful to human beings. However, there have been European reports, chiefly German, claiming that aluminum dust inhalation causes a pneumoconiosis. In Canada, more recently, Shaver's disease has come to attention. This is a severe pneumoconiosis characterized by diffuse fibrosis and emphysema. While the precise etiology is not yet certain, the exposure involves high concentrations of aluminum and silica.

In tuberculous animals, aluminum has been shown to be detrimental and its use is therefore not advised in tuberculous persons.

7. There has been apprehension that the unproven aluminum administration may give a false sense of security and result in relaxation of the proven fundamental environmental controls of silica dust exposure.

8. So far as I know, aluminum has never been tried for the prevention or treatment of diatomaceous earth pneumoconiosis in either animals or man. Dr. Anthony Lanza recently (March 1951) informed me that the Saranac group is soon starting, or has recently started, experimental animal work. He stated it would probably be at least two years till results are known.

   Apparently, it is proposed to use aluminum on human subjects in the diatomaceous earth industry on the strength of the belief that aluminum is beneficial for silicosis and, by inference, for diseases due to other forms of silica.

9. In my conversation with Dr. Lanza, he stated he would not want to wait for the results of animal experiments before instituting the administration of aluminum to human subjects. He also did not seem convinced of the advisability of setting up a control group so that the results could be better evaluated.

10. In conversations, within the past two months, with Dr. Reginald Smart, consultant to the diatomaceous earth industry, he was opposed to using aluminum unless it were first tried out on animals. He was also apprehensive about its possible toxic effects. Dr. Anderson, plant physician, seemed similarly apprehensive at this time.

Conclusions

1. The value of aluminum prophylaxis and therapy for silicosis is not proved.

2. Aluminum has never been tried for diatomaceous earth pneumoconiosis.

3. If aluminum is tried for diatomaceous earth pneumoconiosis, it should preferably be instituted only after adequate animal work indicates its value and the project should be set up in as near a scientific manner as industrial conditions will permit; that is, there should be an adequate group of control subjects whose approximate age distribution and exposures are equal to the treated group.

4. There should be no relaxation in fundamental preventive environmental controls to minimize the dust hazard in this industry.

References

1. Brown, E.W., and Van Winkle, W., Present Status of Aluminum in the Therapy and Prophylaxis of Silicosis, J.A.M.A. 140: 1024-1029, July 23, 1949.

2. Barry, J.W., Aluminum Therapy in Advanced Silicosis, Am. Rev. Tuberculosis 57: 557, June 19[illegible].

Herbert K. Abrams, M. D.
Chief, Bureau of Adult Health

F.U.
5-4-51

April 26, 1951

M. E. Payans, Vice President & Treasurer
Great Lakes Carbon Corporation
18 East 48th Street
New York 17, N. Y.

Dear Mr. Payans:

Some months ago, when we received a bill for continuation of the research program with diatomaceous earth at Saranac Laboratory, the cost of which you previously had agreed to underwrite by one-third, in order to facilitate matters you forwarded to us a check, made payable to the Trudeau Foundation, for your share of the bill, and we in turn forwarded it with our own check for the remaining two-thirds to Saranac. In due course you received an acknowledgement direct from them.

I am wondering whether you want to follow the same procedure in remitting your share of the expense of Dr. A. J. Lanza's trip to California. I am enclosing a copy of a bill which he has sent us for $1262, representing his fee and hotel expenses. In addition, we paid in advance of the trip his round-trip plane transportation, New York-San Francisco, amounting to $345; so that his total fee and expenses amounted to $1607.

If we split this on the same basis as the charges from Saranac, it would be in order for you to send us your check, made payable to Dr. A. J. Lanza, in amount of $535, and we would transmit it to him with our own check for $1072 and ask him to send an acknowledgement direct to you, covering payment of your share of the expense.

It is our feeling, which I believe is shared by Mr. Tellefsen, that Dr. Lanza's trip to the Coast and further check on our mutual problems was very much worth-while to our two companies.

Dr. Mannon so far has not sent us any charges for his trip to the Coast.

Sincerely yours,

J. P. Woodard

Lompoc Plant
April 24, 1951.

AIR MAIL

CONFIDENTIAL

J.P. Woodard , GHQ BOX 91

Dr. Anderson, Mr. Westmont, Dr. Cummins and the writer, reviewed the present status.

The writer advised the group of our recent discussion at Saranac, which included the advice that we have asked Dr. Vorwald for an estimate and program for the use of cortisone in conjunction with aluminum therapy.

The major item at issue was what Messrs. Westmont and Anderson wanted to do about aluminum therapy here at the Plant. Dr. Anderson emphasized the fact that he should be consulted in the formulation of any research program on this subject, and was assured that he was in position to submit any recommendations and items at any and all times, and both Dr. Anderson and Mr. Westmont were assured that every program, to be carried out on this subject, would be submitted to them for their approval, recommendations etc.

In this connection, on the program which is to be carried out at Trudeau on aluminum therapy, Dr. Anderson requests very definitely, and we agree with him, that there should be included, if there is not any, sufficient tests on tuberculosis treated pigs to determine whether or not aluminum therapy has any effect on a superimposed powder condition. We agreed that this should be done.

Dr. Anderson's attitude regarding aluminum therapy was that he was not against it, but he was not for it, account of lack of sufficient technical information on the subject. Certainly we all agree that there is no background for aluminum therapy, as presently known, with Diatomite. I agreed that we would definitely find whether or not there has been an interim report on the McIntyre project (since its inception) published.

Dr. Anderson also states that there are several authorities in this field, i.e. Sanders and Williams, who have been against aluminum therapy, and he felt we should interview these men to find exactly why they are opposed to aluminum therapy.

I gave the group Dr. Vorwald's opinion, received on our April trip to Saranac, that the natural powder was in a much less dangerous class than the flux calcined and special flux calcined powders.

Dr. Anderson will discuss, with Dr. Smart, the question brought up by Mr. Telofson on the status of X-Rays on individuals at Terrebonne, where it is reported that no instances of any kind have occurred during the last fifteen year period, likewise Dr. Anderson will further ascertain whether Dr. Smart has any information on the X-Rays taken in the Great Lakes Basalt Plant as well as Eagle Pitcher Elko plant.

During the discussion, Dr. Anderson stated that no new massive cases had occurred within last several years, but that a progressive linear fibrosis had occurred in several cases. He felt greatly concerned in regard to the susceptibility of individuals with lung changes to T.B. infection and gave his opinion, at the moment, he felt that individuals with marked changes, appeared to be slightly more susceptible than the normal and that such lung changes prevented treatment for such infection responding in the normal manner. This was the opinion expressed by Dr. Smart in the case of Romero.

It was agreed that Messrs. Westmont and Anderson would advise with us within the next several weeks just what they would like to do in the starting up of the aluminum therapy.

A. S. Eisenbast

cc-O.B.Westmont, Lompoc
W.N.Anderson, "
File (AE)

April 23, 1951

Dr. A. J. Lanza, Chairman
Institute of Industrial Medicine
New York University-Bellevue Medical Center
477 First Avenue
New York 16, New York

Dear Tony:

Quoted below is a letter just received from Dr. A. B. Cummins, of our Research Center, wherein he gives certain information about the pH of our Lompoc material and the titratable qualities:

"The pH of Lompoc dusts from natural earth and straight calcined products runs slightly on the acid side of pH 7.0. The dust from the flux calcined products runs somewhat on the alkaline side within the range of 7.5 - 8.5.

"We have considerable data now on the pH values and titratable alkalinities of mill products, but not very much on dusts themselves.

"Because of the questions raised, we will make some tests as suggested and shortly after my return from the West Coast, the early part of May, we may wish to get in touch with Dr. Hannon as you suggest."

I hope this answers the questions that Dr. Hannon asked of you and which questions I, in turn, passed on to Dr. Cummins.

If there is further information needed, may I suggest that Dr. Hannon write direct to:

Dr. A. B. Cummins
Research Center
Johns-Manville Corporation
Manville, New Jersey.

Yours sincerely,

J. P. Woodard

Copy to: Dr. J. W. G. Hannon

MEMORANDUM

TO: Mr. J. Page Woodard
Mr. Donald R. Tellefsen

SUBJECT: Report of trip to Lompoc and Palos Verdes

On Monday March 26, Mr. Page Woodard, Mr. Hugh Jackson, Mr. Donald Tellefsen and I met with Dr. Abrams at the California State Department of Health. Dr. Abrams explained that Dr. Halverson, the State Health Officer was ill and would not be present. Dr. Abrams is head of the Division of Adult Hygiene under which come industrial hygiene activities. He had with him Dr. Christine Kinert, Dr. Leach, and Dr. Bush, the latter heading up the Tuberculosis Division of the State Department of Health.

After a brief review of the whole question of occupational disease at Lompoc and Palos Verdes, the subject of aluminum prophylaxis was very thoroughly discussed pro and con. Dr. Abrams felt that it would be most desirable if the results of the animal experiments with aluminum and diatomaceous earth were available before prophylaxis was undertaken. Dr. Kinert felt that if aluminum prophylaxis could be well supervised and, particularly, if it could be correlated with pulmonary function tests, that such an undertaking might prove of inestimable value not only to industry locally but to industry generally. The attitude of the State Health Department might be summed up in the statement that they would be glad to cooperate in any reasonable endeavor and that they would give us support if the whole project was adequately supervised.

While in San Francisco, Mr. Woodard, Mr. Jackson and I went to Redwood City, went through the plant and examined a number of films and discussed the subject of medical supervision in this plant. The following day I went to the University of California Hospital and met with the manager of the Redwood City plant, his assistant, Dr. Ehst the Company Physician in Redwood City, and Dr. Giansiriusa who has been treating one of the Redwood City employees with cortisone.

On the evening of the 27th, at the invitation of Dr. Abrams, I attended a meeting of the Northern California Industrial Hygiene Association where I made a talk on the general topic of pneumoconioses.

On Wednesday, March 28th, I went to Lompoc where we had a series of discussions with Dr. Anderson, Mr. Westmont, Mr. Legge, Mr. Woodard and Mr. Jackson. It developed that Dr. Anderson had a number of reservations with respect to the advisability of aluminum prophylaxis. All the angles of this were discussed back and forth and I felt that by the time we had left, some if not all of Dr. Anderson's objections had been resolved. Dr. Anderson raised the point that there had been no animal experimentation with diatomaceous earth and aluminum. Our position was that such experimentation was under way and that the information available from all sources made it seem worthwhile to try aluminum prophylaxis without having to wait a year or possibly two years for the results of the animal experimentation which might or might not add materially to our present knowledge. During our stay in Lompoc we made a trip to the plant and I also spent some time with Dr. Anderson in the plant medical department.

On Thursday, the 29th, Mr. Woodard, Mr. Jackson, Mr. Tellefsen and I had a long conference with Dr. Smart in Los Angeles. Dr. Smart also raised the question of the desirability of animal experimentation before proceeding with aluminum prophylaxis and again we discussed this back and forth for some time. He raised the point that if the results of animal experimentation with diatomaceous earth and aluminum were not available before prophylaxis was begun that it might create a detrimental legal situation in the event that any individual might bring suit, against either of the companies, alleging that his lungs had been injured by the aluminum. The following day, Friday March 30th, we had another long discussion with Dr. Smart. On Friday afternoon Mr. Tellefsen, Mr. Stockton and I called upon Mr. Ives, a prominent attorney in Los Angeles and legal consultant for the Great Lakes Carbon Company. We raised the point that Dr. Smart had made and Mr. Ives gave it as his opinion that aluminum therapy had now been used for a number of years in thousands of instances and no untoward effects had ever been reported and no trouble had ever arisen as a result. That inasmuch as diatomaceous earth was a siliceous dust and the companies concerned were endeavoring to protect the health and well-being of their employees and were proposing to institute a prophylactic treatment that gave promise of value, he did not feel that there was any danger of the companies being charged with negligence. This attitude on the part of Mr. Ives seemed to relieve Dr. Smart considerably.

On Saturday, the 31st, Mr. Tellefsen and I visited the plant of the Great Lakes Carbon Company at Palos Verdes where we were met by Mr. Stockton. Here, again, much of the same items that had been discussed in the previous days were gone over again with Mr. Stockton.

After returning to Los Angeles on Saturday evening I had another conversation with Dr. Smart over the telephone. As far as Dr. Smart is concerned I felt that his attitude was that he would very much like to try the aluminum prophylaxis provided that he did not become involved in medico-legal difficulties by so doing.

While in Los Angeles I saw Dr. Rutherford Johnstone and inasmuch as he is now an official consultant to the State Health Department I felt that it was most advisable to discuss our situation with him. The chances are that sooner or later it will be brought to his official notice and if he is prepared it will be greatly to his advantage and to ours.

It should be appreciated that after each conference we had with the various physicians Mr. Woodard, Mr. Jackson, Mr. Tellefsen and I met and thoroughly discussed the various opinions and points of view that had been expressed. We did this to adjust our own thinking and to make certain that we had not left any important points out.

I have the feeling and so do the others who accompanied me that this trip was immensely useful and only by sitting down with all concerned and thrashing out all the points involved could we ever hope to get a fair degree of unanimity among all the parties concerned. Necessarily, there would be divergent views expressed but I feel that these differences can be reconciled so as to permit of a harmonious program.

The following points arose during the course of our visit which were

of particular interest. Dr. Abrams raised the matter of the reporting of occupational diseases. He pointed out that the law was designed to cover acute illnesses and that it was difficult to interpret with respect to chronic occupational disease and was most confusing. He said to us that he felt we were in a better position to make suggestions as to how the regulation might be re-worded and he hoped that we would give him some constructive criticism. Later, in Los Angeles, Mr. Tallefsen and I discussed this question with Mr. Ives. Mr. Ives read over the procedure formulated by Mr. Woodard and Mr. Jackson and in use at Johns-Manville and he said that he was in complete agreement with it and that there was no question in his mind but that that procedure met the legal requirements. However, he thought we should give serious consideration to complying with Dr. Abrams' suggestion. Otherwise, they might go ahead on their own initiative and re-draft the regulation in a form that might be quite objectionable.

While in San Francisco, I had a visit with Dr. Shepard of the Metropolitan Life Insurance Company. Dr. Shepard is the foremost public health authority on the West Coast. He is a friend of the State Health Officer and he was appointed as a consultant to the State Department of Health in matters of industrial hygiene by the Governor. Dr. Rutherford Johnstone of Los Angeles has been similarly appointed for the southern part of the State. Dr. Shepard informed me that a new Medical Director of the State Industrial Commission had just been appointed, namely, Dr. John L. Barritt formerly of San Diego. Dr. Mardo, who is the County Health Officer of Santa Barbara County, has expressed himself in opposition to aluminum therapy. However, I do not feel any particular apprehension on this score and have left the matter in Dr. Shepard's hands who has stated he will gladly be of assistance.

Dr. Smart felt that the literature should be searched so that there would be no possibility of over-looking any reference to aluminum therapy or aluminum prophylaxis that might contain an adverse opinion. He has a competent research assistant on his staff who has already started this job and as soon as the preliminary part of it is finished he will inform us.

Dr. Smart felt that it was desirable to know that aluminum in combination with diatomaceous earth does not develop toxic properties and thought that possibly intravenous or peritoneal injections might determine this in a relatively short period of time. This will be discussed with Dr. Vorwald very shortly.

The matter of pulmonary function tests is of very great importance provided a technique can be devised that is applicable to industrial work in contradistinction to a research laboratory. On April 10th Dr. Hannon, at my request, came to New York to demonstrate a device of his for estimating pulmonary function. There were present at this demonstration Dr. Amberson of Bellevue, Dr. Edgar Mayer, Chairman of the State Committee appointed by the Governor to rule on silicosis cases, and several other persons including members of my staff here. I will make a separate report on this as soon as I have had a chance to discuss the subject with the other persons who were present.

SUMMARY. The following details are to be followed up:

1. Support of Industrial Commission of California.
2. Drafting of regulation on reporting of pneumoconioses. At least attempt should be made to do this.
3. Follow-up of experimental work in Saranac. If necessary, visits to Saranac to find out what progress is being made and what results are evident.
4. Follow-up search of literature on aluminum.

April 11, 1951

A.J. Lanza, M.D.

FILE COPY

Confidential

April 16, 1951

A. S. Elsenbast

Industrial Hygiene - Diatomaceous Earth

Attached is Dr. Lanza's memorandum covering our recent West Coast trip, which is being given to you today so you will have a chance to study this and then review the subject with Westy and the others at Lompoc. Sorry I do not have an extra copy, but if you want to leave this with Westy, do so, for I have one left and can make copies from it.

In addition to the points for follow-up outlined by Dr. Lanza on page 4 of his memorandum, to which we all agreed, I suggest that, inasmuch as it appears likely the McIntyre type of powdered aluminum will be used:

1. We have the mechanical job done of laying out, at least in simple sketch, the method by which we anticipate the aluminum will be administered to people. (We must, of course, first decide who is to be treated, and it is my assumption that certainly all in the mill will be treated, and possibly others, except perhaps those in the office, so as to avoid making the mill operation appear more hazardous than the operations in the rest of the plant.)

2. On the assumption that the use of aluminum will be undertaken, set up the entire plan for the handling of this matter from the angle of personnel affected.

3. We follow the obviously right course of continuing our dust abatement program, realizing that elimination of dust is the really sure way of eliminating all difficulties.

After you come back from Lompoc, I hope we can review this situation together and see what our program should be.

J. P. Woodard

ene

MEMORANDUM

See Revision

TO: Mr. J. Page Woodard
Mr. Donald R. Tellefsen

SUBJECT: Report of trip to Lompoc and Palos Verdes

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/13 - After report was typed, but before distribution, Dr. Lanza learned that Dr. Shepard's information as to Dr. Nardo was not accurate. So far as is known, Nardo will continue on in Santa Barbara County. Shepard just advised Lanza that the new Medical Director will be, instead of Nardo, Dr. John L. Barritt, of San Diego.

SUMMARY. The following details are to be followed up:

1. Support of Industrial Commission of California.
2. Drafting of regulation on reporting of pneumoconioses. At least attempt should be made to do this.
3. Follow-up of experimental work in Saranac. If necessary, visits to Saranac to find out what progress is being made and what results are evident.
4. Follow-up search of literature on aluminum.

April 11, 1951

A.J. Lanza, M.D.

FILE COPY

DMH

April 16, 1951

Dr. A. J. Vorwald, Director
The Saranac Laboratory
P. O. Box 551
Saranac Lake, New York

Dear Art:

Doubtless you made the note during our discussion last Friday that you would look up the matter of the tuberculosis incidence at Lompoc and let us know if you find anything significant.

You will recall that you mentioned your impression that we had had quite a bit of it, whereas we were not aware of this, and you said you would let us know what, if anything, you could find.

I assume, if you locate any pertinent information, you will advise Mr. Elsenbast and me about it.

Yours sincerely,

J. P. Woodard

bc: A. S. Elsenbast

Confidential

FILE COPY

DMH

FLE 5/1

April 16, 1951

A. S. Elsenbast

Industrial Hygiene - Lompoc

Here is a copy of Dr. J. W. G. Hannon's brief letter after his return from the Coast.

He is assuming that we should first decide what people we want to treat before he goes ahead with doing further work on this.

Doubtless you will want to discuss this with Mr. Westmont.

J. P. Woodard

enc

FILE COPY

FU

April 16, 1951

Dr. A. J. Vorwald, Director
The Saranac Laboratory
P. O. Box 551
Saranac Lake, New York

Dear Art:

At our meeting last Friday, you said that there had been a report at the meeting in Australia of eight cases in Holland where there had been lung damage brought about by aluminum.

You agreed that you would send me a couple of copies of this reprint so that we could get this information around to other individuals and see what their reaction is.

Yours sincerely,

J. P. Woodard

bc: A. S. Elsenbast

April 16, 1951

Dr. A. J. Lanza, Chairman
Instutute of Industrial Medicine
N. Y. U.-Bellevue Medical Center
477 First Avenue
New York 16, New York

Dear Tony:

Here is a copy of the notes I made of the discussion Mr. Kleenbast, Mr. Tellefsen, and I had at Saranac with members of the Saranac Laboratory staff on Friday, April 13.

Yours sincerely,

J. P. Woodard

Enclosure

Research Center
April 16, 1951

File: 259-EL-5

J. P. Woodard - GHQ

Industrial Hygiene - Lompoc
Your Letter April 12 to Mr. Eisenbast

The pH of Lompoc dusts from natural earth and straight calcined products runs slightly on the acid side of pH 7.0. The dust from the flux calcined products runs somewhat on the alkaline side within the range of 7.5 - 8.5.

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Because of the questions raised, we will make some tests as suggested and shortly after my return from the West Coast, the early part of May, we may wish to get in touch with Dr. Hannon as you suggest.

A. B. Co[illegible]

ABC ca

cc: A. S. Eisenbast - GHQ
E. R. Williams - Res. Cen.

FILE COPY

Confidential

April 16, 1951

A. S. Elsenhast

Diatomaceous Earth Pneumoconiosis

When we met with the Saranac staff last week, you will recall that Mr. Tellefsen, of Great Lakes Carbon, said he had been given to understand that no lung changes had occurred among workers at the Basalt plant where natural powders are being handled, and, further, that Dr. Smart had not even found any lung changes among the workers at Terrebonne, Oregon, where flux-calcined material is made. At both locations, fresh water material is understood to be the type of deposit, though this may not be significant.

It seemed no one in the group knew why there should be the difference between flux-calcined at Oregon and at the California plant because it had been assumed that, chemically, the two materials were about the same.

Doubtless Dr. Cummins is familiar with this, and perhaps he knows of some significant difference in the material. It would appear that this should be followed up.

You might discuss this with Reg Smart himself if you get a chance, or perhaps Dr. Lanza should check it with him.

J. P. Woodard

cc: A. J. Lanza, M. D.
A. B. Cummins, Manville Research

(Copy of draft of Dr. L a's report)

April 11, 1951

M E M O R A N D U M

Mr. Woodard:
Mr. Tellefsen:

Subject: Report of trip to Lompoc and Palos Verdes

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I have the feeling and so did the others who accompanied me that this trip was immensely useful and only by sitting down with all concerned and thrashing out all the points involved could we ever hope to get a fair degree of unanimity among all the parties concerned. Necessarily, there would be divergent

views expressed but I feel that these differences can be reconciled so as to permit of a harmonious program.

The following points arose during the course of our visit which were of particular interest. Dr. Abrams raised the matter of the reporting of occupational diseases. He pointed out that the law was designed to cover acute illnesses and that it was difficult to interpret with respect to chronic occupational disease and was most confusing. He said to us that he felt we were in a better position to make suggestions as to how the regulation might be re-worded and he hoped that we would give him some constructive criticism. Later, in Los Angeles, Mr. Tellefsen and I discussed this question with Mr. Ives. Mr. Ives read over the procedure formulated by Mr. Woodard and Mr. Jackson and in use at Johns-Manville and he said that he was in complete agreement with it and that there was no question in his mind but that that procedure met the legal requirements. However, he thought we should give serious consideration to complying with Dr. Abrams' suggestion. Otherwise, they might go ahead on their own initiative and re-draft the regulation in a form that might be quite objectionable.

While in San Francisco, I had a visit with Dr. Shepard of the Metropolitan Life. Dr. Shepard is the foremost public health authority on the West Coast. He is a great friend of the State Health Officer and he was appointed as a consultant to the State Department of Health in matters of industrial hygiene by the Governor. Dr. Rutherford Johnstone of Los Angeles has been similarly appointed for the southern part of the State. Dr. Shepard informed me that a new Medical Director of the State Industrial Commission had just been appointed within the last day, namely, Dr. Nardo, who, for the previous three months, had been County Health Officer in Santa Barbara County. Dr. Nardo had expressed himself in opposition to aluminum therapy and obviously, of course, nothing can be done unless the State Industrial Commission modifies its views. However, I do not feel any particular apprehension on this score and have left the matter in Dr. Shepard's hands and as

soon as I hear further from him I shall let all concerned know.

Dr. Smart felt that the literature should be searched so that there would be no possibility of overlooking any reference to aluminum therapy or aluminum prophylaxis that might contain an adverse opinion. He has a competent research assistant on his staff who has already started this job and as soon as the preliminary part of it is finished he will inform me.

Dr. Smart felt that it was desirable to know that aluminum in combination with diatomaceous earth does not develop toxic properties and thought that possibly intravenous or peritoneal injections might determine this in a relatively short period of time. This will be discussed with Dr. Vorwald very shortly.

The matter of pulmonary function tests is of very great importance provided a technique can be devised that is applicable to industrial work in contradistinction to a research laboratory. On April 10th, Dr. Hannon, at my request, came to New York to demonstrate a device of his for estimating pulmonary function. There were present at this demonstration Dr. Amberson of Bellevue, Dr. Edgar Mayer, Chairman of the State Committee appointed by the Governor to rule on silicosis cases, and several other persons including members of my staff here. I will make a separate report on this as soon as I have had a chance to discuss the subject with the other persons who were present.

SUMMARY

The following details are to be followed up:

1. Support of Industrial Commission of California.

2. Drafting of regulation on reporting of pneumoconioses. At least attempt should be made to do this.

3. Follow-up of experimental work in Saranac. If necessary, visits to Saranac to find out what progress is being made and what results are evident.

4. Follow-up search of literature on aluminum.

Confidential

April 12, 1951

A. S. Eisenbart

Industrial Hygiene - Lompoc

Two or three points were made by Dr. Hannon after his return from the West Coast in conversation with Dr. Lanza, and the following are some that seem worth passing on at the moment:

(1) He suggested that we determine the pH of the aerial dust in the mill, i.e., the dust that would likely be taken into the lungs.

(2) If the pH is high, then try to reduce it in whatever way seems feasible.

(3) Determine the titratable alkalinity of the dust.

Dr. Hannon's belief is that the adverse effect of the dust may be materially greater than it otherwise would be because of the alkalinity of the dust. I don't know on what he bases this theory, but Dr. Lanza seemed to be impressed by it.

My knowledge of chemistry is very limited, but I am sure these points will be of greater meaning to you and Dr. Cummins.

I wonder if it will be practicable and feasible to make the determination that Dr. Hannon suggests. Will Dr. Cummins please answer this question and suggest what might be done. It might be well if Dr. Cummins would himself explore this with Dr. Hannon by writing to him. His address is:

J. W. G. Hannon, M. D.
McIntyre Research Foundation
628 Washington Trust Building
Washington, Pennsylvania

J. P. Woodard

cc: A. B. Cummins, Manville Research

D.H.Q.
April 11, 1951

Dr. A.B. Cummins - - Manville

"Identification of Aluminum Hydrate Films
Of Importance in Silicosis Prevention."
L.H. Germer and K.H. Storks,
Bell Telephone Laboratories, N.Y.C.

- - - - - - - - -

The above article was reprinted from Analytical Edition of "Industrial and Engineering Chemistry," Vol. 11, Page 583, November 15, ~~1938~~ 1939

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Referring to the above, I think it would be well worth your while, or that of one of your men, to have a discussion with the people who wrote this paper to see if they have any further ideas on this aluminum film silica coating to-day as compared to their observations at the time the above paper was written. With present day equipment and the information obtained within the last ten years, these people might be very helpful to us.

Arthur Elsenbast.

cc: J.P. Woodard
H.M. Jackson

PROPOSAL

POWDERED ALUMINUM HYDROXIDE IN DIATOMACEOUS EARTH PNEUMOCONIOSIS

to

Johns-Manville Corporation

New York, New York

by

The Saranac Laboratory
of
The Edward L. Trudeau Foundation

Saranac Lake, New York

Submitted by:

Arthur J. Vorwald, M. D.
Director, The Saranac Laboratory and
The Edward L. Trudeau Foundation

October 6, 1950

INTRODUCTION

In furtherance of a discussion held in Saranac Lake, New York, on June 29, 1950, by Mr. Arthur Eisenhart, Mr. Page Woodard, and Dr. A. B. Cummins of the Johns-Manville Corporation, New York City, and representatives of the Saranac Laboratory, and in response to subsequent requests from Mr. Eisenhart and Mr. Woodard, a proposal is submitted herewith covering the methods, time, cost, and other factors in connection with an experimental study of Powdered Aluminum Hydroxide and Diatomaceous Earth Pneumoconiosis.

THE PROBLEM

In essence, the problem is to determine the prophylactic and therapeutic effectiveness of Powdered Aluminum Hydroxide in the inhibition and stabilization of the pulmonary fibrosis resulting from the inhalation of Regular Flux-calcined Diatomaceous Earth.

DISCUSSION

The Powdered Aluminum Hydroxide is a product developed and prepared by the Saranac Laboratory. It has been used by us during the past eight years in a large series of experimental studies which warrant the following conclusions:

1. Experiments by injection and inhalation showed no evidence of any toxicity or any chronic change that appeared to affect the health of the animals.

2. When used prophylactically, viz. given prior to or simultaneously with quartz dust, the product gave complete protection against silicosis.

3. When used therapeutically, viz. given after the development of a silicotic process, the product was very effective in preventing progression of silicotic lesions in the lungs. The action was limited, however, to the lungs with little or no evidence of prevention in the tracheobronchial lymph nodes.

In consequence of these results we believe that the Powdered Aluminum Hydroxide will have similar prophylactic effect and will inhibit the pulmonary reaction to inhaled Diatomaceous Earth. It appears logical, also, that its therapeutic effect should be no less with Regular Flux-calcined Diatomaceous Earth than with free crystalline silica in the form of quartz. We have never tested the product, however, with free crystalline silica in the form of cristobalite which, from evidence to date, is at least one of the components in the etiology of the pulmonary fibrosis in Diatomaceous Earth workers. In addition, we do not know whether other components of the Diatomaceous Earth will combine in some unfavorable way with the Powdered Aluminum Hydroxide, thus minimizing the prophylactic and/or therapeutic effectiveness. Without further study it is impossible to know whether that combination will stimulate in the lung a disease process much more severe than that due to Diatomaceous Earth alone.

Study of pulmonary tissue from Diatomaceous Earth workers and from experimental animals exposed to the flux-calcined product reveals a tissue reaction with persistent cellular fibrosis. The

development of mature fibrosis with hyalinization is long delayed and seldom reaches the intensity typical of the reaction to free crystalline silica in the form of quartz. It is highly probable that the amorphous silica present in Diatomaceous Earth accounts for this difference. In any event, the fact that the tissue response remains more cellular leads to the conjecture that Powdered Aluminum Hydroxide may be even more effective with the Diatomaceous Earth type of fibrosis than with the less cellular silicotic type. For that reason, we propose both a prophylactic and therapeutic trial of the hydroxide in experimental animals exposed to the flux-calcined product.

The flux-calcined product is suggested because that product is more severe in producing pulmonary damage than is the Natural Earth and because the processing of the calcined product within enclosed spaces of the industrial operation would permit dispersion of the Hydroxide into the general atmosphere of those spaces.

In view of our studies, it must be conceded that the Natural Earth is not an innocuous agent. However, if the Hydroxide should prove to be effective against the more injurious calcined product, there is every reason to believe that it would act similarly against the Natural Earth.

In submitting the proposal we have debated the introduction of a second room for exposure of animals to the inhalation of equal atmospheric concentrations of the calcined product, but without the Hydroxide. Thus, control animals could be studied. However, we

elected not to set up the control room because the character and extent of tissue reaction at intervals of exposure to the calcined product is known from previous experience. Also, introduction of the control room would more than double the cost of the experiment and occasion, we believe, unnecessary expense to the Johns-Manville Corporation.

Methods

The method employed would be similar to that in the experiments currently under way with Diatomaceous Earth products. The flux-calcined earth would be disseminated in a dust room. The atmospheric concentration of the dust would be controlled at a level of about 500 million particles per cubic foot of air so that the chronic pulmonary changes might be produced within as short a time as possible. A series of guinea pigs and white rats would be exposed. Concomitantly, Powdered Aluminum Hydroxide would be atomized in the form of a mist into the room. The atmospheric concentration of the powder would be maintained at a level which we have identified as effective against free crystalline silica in the form of quartz. Animals would be sacrificed at intervals during the course of the experiment while others would remain in the dust until its termination. The lungs of these animals would be analyzed chemically and petrographically for the presence of silica and aluminum. They and other tissue would also be studied histologically to determine the character and extent of the pathology present.

It will be noted that a room has been substituted for a chamber in the experiment. This is believed advisable not only because the room allows a greater number of animals, but also because it affords more space for the technical phase of the study, necessitating two dispersion units, one for the Diatomaceous Earth and one for the Powdered Aluminum Hydroxide. In addition, since more space would be available, it would be possible, if desired, to introduce a number of cancer-bearing mice for study of any possible relationship between Diatomaceous Earth pneumoconiosis and pulmonary cancer. This, we believe, might be accomplished in as short a time as twelve months.

Duration of Investigation

Twelve months.

Reports and Publications

Interim progress reports will be issued from time to time as experimental results may warrant and a final report will be submitted at the termination of the experiment. Before publication, the manuscript will be submitted to Johns-Manville for review.

COST

The use of a room will eliminate the expense of a new chamber. Thus, all of the financial support can be directed to the immediate problem with space enough for a significantly valid number of animals and for an extension of the program to pulmonary cancer.

Proposal

ALUMINUM HYDROXIDE MIST AND POWDERED METALLIC ALUMINUM (McINTYRE) IN DIATOMACEOUS EARTH PNEUMOCONIOSIS

(Substituting Page 6 Proposal dated October 6, 1950)

The budgetary requirements for pursuing an investigation concerning the use of two forms of aluminum, in accordance with a telegram dated December 13, 1950, signed "Jackson" Johns-Manville Corporation, are as follows:

1.	Salaries for Personnel	$7,000.
	Pathologist, industrial hygienist, chemist, technicians, animal caretaker, secretarial assistance	
2.	Capital Equipment	
	Four dust dispensers	500.
	Two complete atomizing units	200.
3.	Expendable Supplies	
	Animals and food	900.
	Chemicals, glassware, slides, etc.	400.
4.	Institutional Overhead	
	Maintenance of two dust chambers	1,500.
5.	TOTAL	$10,500.

(submitted December 15, 1950)

Initiation of Experiment

The room will be available on November 1 - at which time the experiment can be started should Johns-Manville Corporation wish the Saranac Laboratory to pursue the investigation.

AJV:bw

7. On Tuesday night, March 27, Hugh Jackson and I went to Lompoc.

8. You went to Lompoc on Wednesday morning, March 28. There was a meeting on that date with Plant Manager Westmont, Dr. Anderson, and E. T. Legge. Dr. Anderson shied away from the aluminum therapy and disclosed a letter from Dr. Nardo that said more proof was needed.

9. In Los Angeles, you, Don Tellefsen, Hugh Jackson, and I met with Dr. Stockton and Dr. Smart on aluminum therapy subject. Dr. Smart also seemed to think more proof was needed and suggested that the following four things be done at our meeting on March 29:

   a. Search literature and locate all references to aluminum therapy, giving these references to all concerned (presently someone in Dr. Smart's office is looking up the references). If someone has to summarize this information, it will have to be done later and there should be some determination made as to what articles should be briefed and which should not be briefed.

   b. Dr. Smart states we should first know that diatomaceous earth and aluminum in combination do not make animals die faster than our dust alone or some other combination with aluminum. He seemed to think that six months' tests at Saranac with the high concentrations should show this, particularly after the first animals have been sacrificed.

   c. Dr. Smart wonders whether or not diatomaceous earth and aluminum in combination are toxic. He suggests intra-venous and peritoneal injections be tried out to determine this. (It is thought that Saranac is running such tests, anyway.)

   d. Dr. Smart suggests that Dr. Hannon take his machine to Motley in Philadelphia so as to compare their ideas. He also suggests that you check with Emerson in Boston as to vital capacity or lung capacity tests.

10. You went to see Dr. Johnstone, and were to go to Great Lakes Carbon plant at Palos Verdes. You also saw their legal expert, Mr. Ives, and discussed the matter of when reports should be made in the case of X-ray evidence of pneumoconiosis.

* * * * * *

These are the only items I have. Of course, I have a very firm note to send a copy of the Saranac program to Andy and I will do it.

If your report to me should cover all points completely, I had assumed that I would only need to send copies of this report to others within our organization who are interested and suggest the steps we should take from this point on with the knowledge that we have as of now. Of course, this suggestion from me might be a mere concurrence with what you propose, if you propose steps to be taken. I was going to say I thought we should do four things:

FILE COPY

April 10, 1951

Dr. A. J. Vorwald, Director
The Saranac Laboratory
P. O. Box 551
Saranac Lake, New York

Dear Art:

Recently I have been fortunate in being able to spend considerable time with Mr. D. R. Tellefsen, of the Great Lakes Carbon Corporation, who is the lay member of their organization very much interested in the diatomaceous earth program.

Mr. Tellefsen mentioned that he had not been to Saranac, even though you are working on some Pearlite products, that he would like to come up some time, and we agreed that we would, within the next few weeks, spend a day there.

Our being there would not require a great deal of your time nor that of any of your specialists, who we know are very busy. Nevertheless, we would like to be there at a time you would consider convenient, and I wonder if you would please give me a few days two to four weeks hence when it would be convenient for us to be there.

Yours sincerely,

J. P. Woodard

6/13 ~~HMJ~~ DMH

April 10, 1951

Dr. A. J. Lanza, Chairman
Institute of Industrial Medicine
New York University-Bellevue Medical Center
477 First Avenue
New York 16, New York

Dear Tony:

Here are some notes I made of our various meetings and which, as mentioned when you were here yesterday, may remind you of some other items that come up on which you do not have notes.

I assume our objective was to review with State people, legal and medical advisers, and the local management groups in Great Lakes and J-M the subject of the use of aluminum dust with diatomaceous earth to determine whether the use of aluminum therapy should be initiated, and if so, in general, when, in what manner, and what people would be given the treatment, etc.

1. You, Hugh Jackson, Don Tellefsen, and I met in San Francisco on March 26 with Dr. Abrams and some of his staff, consisting of Drs. Bush, Einert, and Leach, to review with these State Health authorities the subject of aluminum therapy and our present thinking about its use in our two companies in order first to get their reactions.

2. My notes say that they appreciated our attitude in reviewing the subject with them, that they confessed some lack of information and experience on the subject, but that they felt we were right in going ahead with a properly-controlled program.

3. Dr. W. L. Halverson, head of the State Health Department, was ill and did not meet with the group.

4. You later visited, at the invitation of Dr. Abrams, the new Industrial Hygiene Laboratory in Berkeley.

5. Late Monday afternoon, March 26, we all went to Redwood City to inspect the plant and talk with the local management, particularly about the two asbestosis cases--Palomar (disabled and receiving compensation) and Leahy (supposedly ill, but still working and coming back on the job a few days after we were there).

6. It will be recalled that Leahy is taking cortisone, and you met with Dr. East and others, along with Leahy, at the hospital on Tuesday, March 27, to discuss this matter. I believe you said Leahy said he felt better, but no one could quite see why he should.

I. Follow up on the search of literature to get as promptly as possible references on aluminum therapy.

II. Push Seranne to see that we get all possible information as quickly as we can from the work that they are doing. (Dan Tellefsen told me yesterday he just heard Seranne has only now started on the run, which is a surprise to me.) ? why

III. Lay out our plans as to just how aluminum will be administered, assuming that it is to be, and how we expect to handle the personnel matter of telling the men about it. The purpose of doing these two things now would be in order that we might have had a chance to think the thing through and discuss it from all possible angles and be in a position to move promptly when we decide to do so.

IV. Continue to carry out our dust abatement program with all the energy we can command, realizing that elimination of dust is the sure way of preventing illnesses caused by dust.

You said we would get together on your report and I hope you will give me a ring when you get at it. I am sorry I didn't get this in the mail to you on Monday.

Yours sincerely,

J. P. Woodard

FILE COPY

FW
4/20
4/30
5/7

April 10, 1951

Dr. A. J. Vorwald, Director
The Saranac Laboratory
P. O. Box 551
Saranac Lake, New York

Dear Art:

In your letter of February 14, which was in reply to mine of January 23, you said you were struggling with the implications in connection with the diatomaceous earth products, as agreed.

From the conversation we had there, we judge the concentrations of particles per cu. ft. will be fairly high and that some changes, if any appear, can be noted after a relatively few months--perhaps six. On this basis, and assuming that you started the middle of February when you wrote, it would seem that some such sensings could be had by the middle of August.

Questions have been raised at times about just what will result in these tests with diatomaceous earth, which have not heretofore been run, and that is the reason for my writing you about this.

I wonder if you will let me know about this as soon as you can.

Yours sincerely,

J. P. Woodard

Copy to: A. J. Lanza, M. D.

bc: A. S. Elsenbast
H. M. Jackson

FILE COPY

Confidential

General Headquarters
April 10, 1951

O. B. Westmont - Lompoc

Industrial Hygiene - Lompoc

You will recall it was mentioned when we were there at Lompoc that there was no copy there of the Saranac Proposal for the experiment they are running on aluminum and diatomaceous earth.

Attached is a copy of the Saranac Proposal entitled "Powdered Aluminum Hydroxide in Diatomaceous Earth Pneumoconiosis," dated October 6, 1950. This was to be followed with some changes, which I believe were only the following:

1. One chamber was to use McIntyre powdered aluminum and another the powdered aluminum hydroxide as originally proposed by Saranac.

2. The matter of whether 500 p.p.c.f. will be used or whether that quantity is too high is not yet definitely determined. Dr. Vorwald now says this is a far lower concentration than that which killed the animals in the other experiment. This will be checked with him.

3. It was understood that interim reports would be issued at intervals not greater than four months.

4. There was some consideration given to running tests on cancer-bearing mice, but it was decided not to do this.

J. P. Woodard

enc

cc: A. S. Elsenbast

General Headquarters
February 20, 1951

MINUTES

Industrial Hygiene Meeting
Tuesday February 13, 1951

M. E. Puyans
B. H. Anglin
J. W. G. Hannon, M.D.
A. S. Elsenbast
A. J. Lanza, M.D.
J. P. Woodard
H. M. Jackson

1. Saranac Program, Diatomaceous Earth.

Dr. Lanza reviewed the background of aluminum therapy and in particular its development by McIntyre Research Foundation.

Mr. Woodard reviewed the Saranac proposal for animal experimentation using the McIntyre aluminum and the Saranac aluminum hydroxide. The program will take about a years time and will cost $10,500.

General discussion clarified several questions and in conclusion, Mr. Puyans stated that Great Lakes Carbon was very much interested in the program and desired to participate in it on the same basis as they had in the previous diatomaceous earth research.

2. Lompoc Program Under Consideration

Dr. Lanza reviewed the clinical experience at the Lompoc location and pointed out that Doctors Irwin and Forwald were of the opinion that aluminum therapy might prove even more effective for this type of pneumoconiosis than for silicosis.

Dr. Hannon reviewed the methods of initiating a program of aluminum therapy and stressed the importance of personal contact and an honest, straightforward approach to the employee. He advised that in approximately 75 installations, he had experienced no difficulty or interference from the local union.

It was agreed that it would be desirable to keep state health authorities informed on the program and its progress.

3. Conclusions

A. Mr. Puyans indicated that Great Lakes Carbon Corp. would participate in the aluminum therapy program if their consultant medical opinion was in agreement.

B. Dr. Hannon is to advise how soon he can make a trip to the West Coast for the purpose of:

February 20, 1951

(a) surveying the Great Lakes Carbon Corp. and J-M facilities and contacting plant managements,

(b) consulting with medical personnel, Dr. Smart and Dr. Andersen,

(c) consulting with our legal advisors, Herlihy and Herlihy.

C. Dr. Hannan will report the findings and recommend types of equipment and methods of procedure.

D. Representatives of Great Lakes Carbon and J-M will review and make final decision on the aluminum therapy program.

E. Dr. Lanza will meet with the California State Health Authorities to acquaint them with the details of the program.

H. M. Jackson

FILE COPY

February 19, 1951

Mr. A. J. Vorwald, Director
The Sarnoff Laboratory
P. O. Box 591
Sarnoff Lab., New York

Dear Art:

On Tuesday, February 13, representatives of the Great Lakes Carbon Corporation met with some of us in Johns-Manville, at which time we reviewed the industrial hygiene phases of the diatomaceous earth problem.

They are very much interested in the program that you are undertaking and are joining with us in this program.

Accordingly, will you kindly send to:

Mr. M. E. Pegram, Vice Pres. & Treasurer
Great Lakes Carbon Corporation
18 East 48th Street
New York 17, New York

copies of all interim reports and other communications of this type, just as you send them to us.

Incidentally, it was mentioned by the Great Lakes people that they should like to have one of their people come up to Sarnoff some time with us, and both Mr. Eisenhart and I thought it might be well to arrange for such a visit within the next month or two at a time that will be mutually convenient.

I note from your letter of February 14 that you are proceeding with the tests on diatomaceous earth with aluminum hydroxide mist and powdered metallic aluminum.

We shall look forward to receiving your progress reports on these investigations at intervals of approximately four months.

Yours sincerely,

J. P. Woodard

bc: A. J. Lanza, M. D.
A. R. Fisher
Vandiver Brown
A. S. Eisenhart
L. C. Hart
C. W. Hite
H. M. Jackson

January 26, 1951

Dr. A.B. Cummins - Manville

Archives of Industrial Hygiene and
Occupational Medicine.
Volume 1 - Number 3 - March 1950.

Confirming our conversation regarding the Jephcott-Johnston article on solubility:

This is of intense interest, again confirming the amount of information available on this subject.

I note that these people were sent samples of our Snow Floss, Super Floss and 505 and give credit to our Company for our assistance. I wonder who it was who selected these particular products for them?

It also is very interesting to note the various products that these people tested, including Santocel and the various silicas available from the aluminum industry. I particularly noted the diffraction patterns pictured on Page 327, showing no cristobalite pattern on Snow Floss.

Confirming our conversation, I would suggest that you review all of the footnote references shown in this article and obtain for our files copies of all these articles of pertinent interest.

You will notice that there was work along this line as early as 1917.

The references to the catalyst and silica gel products are of interst.

I also note on Page 325 that footnote 13 shows that experimental studies on the action of silica gel administered to guiena pigs were worked on by this group.

You will recall when we discussed this subject previously that it appeared there was nobody else in the U.S. or Canada other than the Trudeau Laboratory that could do work of this kind. Possibly there are other places that could do work for us.

It would certainly appear that Messrs. Woodard and Jackson should make themselves acquainted with Messrs. Jephcott and Johnston, in the Department of Health of Ontario, Division of Industrial Hygiene, as they seem to have a great deal of information on this whole subject.

I am sending this volume to Mr. Woodard for his information.

Arthur Eisenbest.

cc: O.B. Westmont - Lompoc
J.P. Woodard
H.M. Jackson
V. Brown.

Confidential

January 26, 1951

MEMORANDUM

Industrial Hygiene - Lompoc

It was learned today that:

(1) Dr. Hannon has commitments here and in Canada, but can go to Lompoc in connection with the aluminum therapy work almost any time after February 15.

(2) Dr. Lanza will be here up until February 15, at which time he expects to go out of town and will not be back until March 1.

He feels that he should not consider a trip to the West Coast before about the middle of March.

J. P. Woodard

cc: A. R. Fisher
A. S. Elsenbast
H. M. Jackson

D.H.Q.
January 16, 1951

O.B. Westmont - Lompoc

Aluminum Therapy Research - Saranac

I have noted with interest copy of Dr. Anderson's letter to you dated January 9 on the above.

I was particularly anxious to have Dr. Irwin visit Lompoc so that Dr. Anderson, Mr. Legge and yourself could have a firsthand chance to discuss this subject with him. Certainly, all of us are making every effort to provide a healthful setup for our employees. Our efforts are continuing as actively as possible in the prevention of dust conditions and you, further have a medical program to keep you advised and to assist you with present information on the handling and treatment of any disabilities and we are all interested in any additional method of improving the health and protection of our employees.

Our information and advice until this past Summer on the subject of aluminum therapy was that the treatment or protective use of the system did not have sufficient background to enable our medical consultants to properly advise us on its efficiency. This Summer, when we visited Saranac Laboratories, for the first time Dr. Vorwald and his associates stated definitely that aluminum powder therapy on their experimental animals with silica dusts was a definite protective agent. This item was covered in my memorandum to you dated June 30, 1950. We were advised at that time that Dr. Vorwald had a aluminum hydrate compound which he felt was even more effective than the so-called metallic aluminum powder and that on checking the effects of this product, not only in the laboratory but in the field, proved this to be so. After some discussion it was arranged that Dr. Vorwald would give us an estimate of treating experimental animals with this aluminum therapy and Messrs. Woodard, Cummins and the writer were immediately interested in such a program. Meanwhile, Dr. Lanza was making a trip to the Coast and on his return gave us a confidential memorandum on the condition of certain of our men at Lompoc. Other than removing men from the presence of the dust at the plant, there was no further recommendation made. The subject of removing men from Lompoc was discussed with you and Dr. Anderson and it was decided on my trip in September that this would be, in most cases at this time, a detrimental proposition. During the discussion in New York with Dr. Lanza after his trip and the above report, the writer, having in mind the discussion with Dr. Vorwald in June on aluminum therapy, questioned Dr. Lanza directly as to whether or not Dr. Lanza believed that aluminum therapy would be helpful at Lompoc. Dr. Lanza, in the meantime, had discussed this subject with Dr. Schoeppers, who had spent considerable time at the McIntyre Porcupine Mines in Canada, studying aluminum therapy. Dr. Schoeppes had advised Dr. Lanza that he felt that a treatment of this type had merit and that he planned to introduce it in So. Africa.

The writer questioned Dr. Lanza as to whether or not the Aluminum Company of America had ever had any difficulty with any of their own men from aluminum powder. Dr. Lanza thereupon stated that he was well acquainted with Dr. Irwin, of the Aluminum Company

of America, who likewise was fully acquainted with the whole subject of aluminum therapy and that he would have a conversation with Dr. Irwin to not only obtain his advice and information on the effect of aluminum powder on the Aluminum Company employees but that he would get additional information from Dr. Irwin on the subject of aluminum therapy. As a result of the information obtained above, Messrs. Jackson, Woodard and the writer visited the McIntyre Porcupine Mines and obtained the entire story, so far as it was possible from Mr. Ennis at the McIntyre Mines.

The final outcome of all of the above, which included an additional trip by Mr. Jackson to the McIntyre Mines and further consultations with Drs. Lanza, Irwin and Hannon, was to the effect that the solubility tests should be run on aluminum hydrate as compared to the McIntyre aluminum powder and that we should use the product which showed the greatest silica insolubility.

In the meantime, we had asked for a definite program from Dr. Vorwald. We had also received a firsthand story from Dr. Irwin and Dr. Hannon on the practical application of aluminum therapy in the plants.

The analytical tests are proceeding and Dr. Cummins telephoned me Friday the very startling preliminary information that the black aluminum McIntyre powder produced an almost insoluble condition of diatomite (Super Floss Grade) in the preliminary experiments. We are planning to test at Manville Hyflo, Filter-Cel, Snow Floss, 505 and Super Floss to run the entire range of particle size and calcined condition of our products. Messrs. Woodard and the writer have been discussing the subject of Dr. Vorwald's program and what we should actually do, even though we received the above preliminary information from Dr. Cummins.

As the matter stands, so far as the application of aluminum therapy is concerned, there is a very decided satisfactory backlog of experience on the use of the McIntyre aluminum powder. We have no information clinically on the results of the aluminum hydrate. Neither Drs. Lanza, Irwin or Hannon see any reason why the application of the McIntyre powder should be other than helpful. So far as we can determine Dr. Vorwald has never prepared, other than on a small scale, the product which he is favoring. Our tests as carried out at Saranac have taken so long to complete that if we follow Dr. Vorwald's advice and wait for the animal dusting powder experiments to be completed with his aluminum hydrate, we will be able to do nothing until 1954.

In the meantime, unless we run at the same time in his animal testing experiments, the McIntyre powder, we will have no information as to whether one was better than the other.

In view of all of the above, I wrote Mr. Woodard under date of January 4 advising that our program at Saranac should include the testing of both products. I expressed myself further on the subject of the cancer bearing mice in that same letter.

I am reviewing all of the above so that you can discuss this subject with Dr. Anderson and so that he will know just exactly what we are thinking. If Dr. Anderson has any ideas on the whole subject, we welcome and solicit his views and we would likewise wish this information as quickly as possible.

COPY

ALUMINUM COMPANY OF AMERICA

Pittsburgh 19, Pa.
January 2, 1951

Mr. A.S. Elsenbast
Johns-Manville Corporation
22 East 40th Street
New York, N.Y.

Dear Mr. Elsenbast:

I have been tardy in telling you how much I enjoyed meeting you and your confreres in New York at the luncheon meeting on December 19 and my subsequent visit to your mining operations at Lompoc.

Unfortunately, my stay at Lompoc had to be limited to a long half day, but due to the personal guidance and hospitality of Messrs. Westmont and Legge, I was able to cover the operations. Both the deposits and operations are extensive and obviously are here to stay.

Your company is to be congratulated on the effectiveness of the Lompoc dust control program--past, present, and future. Although so much has been and will be accomplished in this regard, I question whether practical dust control measures alone will solve this problem.

It was a pleasure to see Dr. Anderson again and have him review the medical program, which is comprehensive.

I came away from Lompoc with the thought that as a second line of defense to your present dust control and medical programs aluminum treatment and prevention should be worthwhile. With such efforts I feel that five years hence the Lompoc hazard will be greatly lessened, if not completely eradicated.

The minutes of the New York conference prepared by Mr. H.M. Jackson have just arrived and set forth my understanding of that meeting in a clear and concise manner. With personal regards, I am

Very truly yours,

Dudley A. Irwin, M.D. (signed)
Medical Director.

cc: Dr. A.J. Lanza
Dr. J.W.G. Hannon

A.R. Fisher
J.P. Woodard
H.M. Jackson
O.B. Westmont - - Lompoc

CHART NO. 1
Table No. 1

NEW CASES -- SILICOSIS

AS DIAGNOSED IN VARIOUS YEARS, 1925 - 1948

STATUS WHEN DIAGNOSED

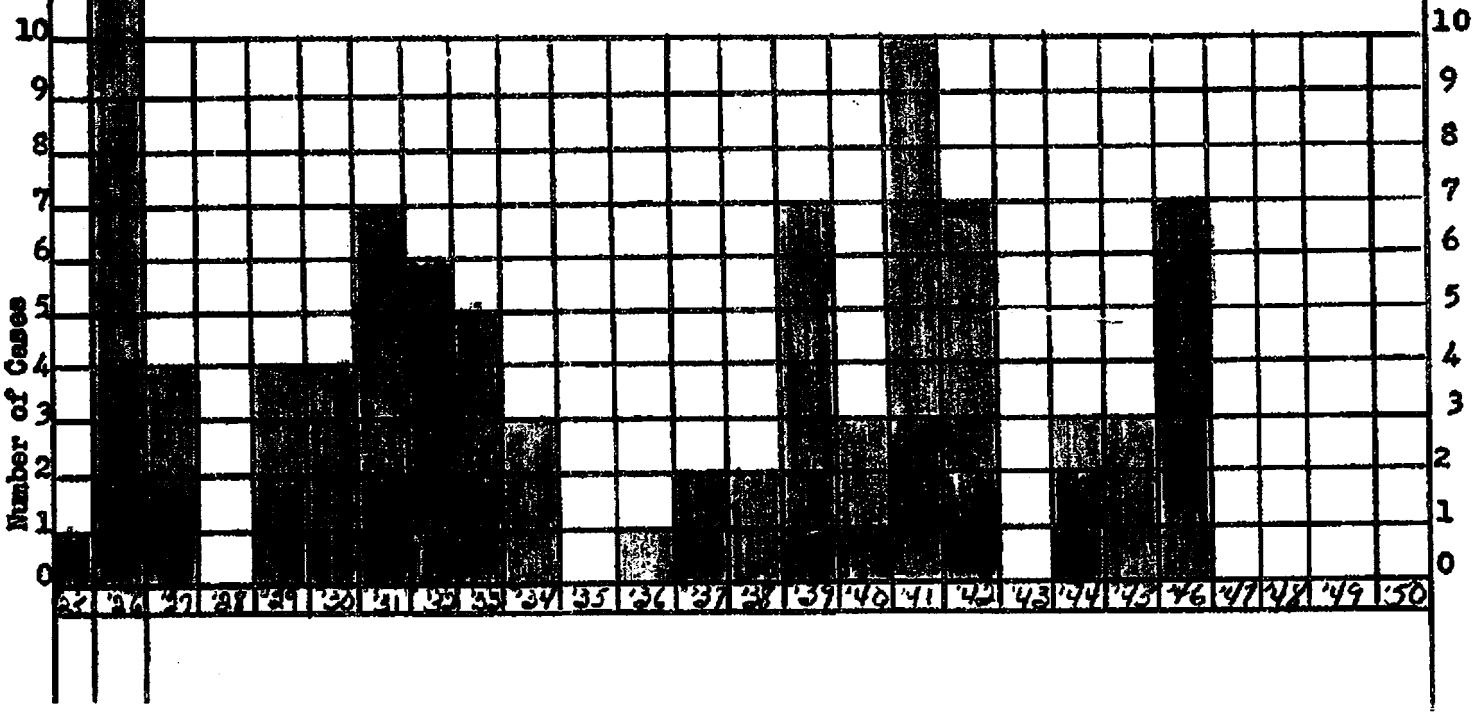
Ante Primary
Non-Clinical, Disability Minus 25%

PRIMARY
Disability 25% to 50%

SECONDARY
Disability 50% of 100%

Number in block is McIntyre file number for the case

A = No claim filed



THE TRUDEAU FOUNDATION
FOR
THE CLINICAL AND EXPERIMENTAL STUDY OF PULMONARY DISEASE

AT SARANAC LAKE, N.Y.

THE SARANAC LABORATORY
THE TRUDEAU FOUNDATION
THE TRUDEAU SCHOOL

OFFICE OF DIRECTOR
P.O. BOX 551
SARANAC LAKE, N.Y.

AT TRUDEAU, N.Y.

THE DEPARTMENT OF PHYSIOLOGY
THE DEPARTMENT OF BIOCHEMISTRY
THE DEPARTMENT OF RADIOLOGY
THE TRUDEAU LABORATORY

November 3, 1950

W. M. Anderson, M.D.
Plant Physician
Johns-Manville Products Corp.
Lompoc, California

Dear Andy:

A letter from the head office in New York tells me that a copy of our last progress report concerning diatomaceous earth has been forwarded to you. This report, I believe, will answer your questions.

We are considering the use of colloidal aluminum hydroxide as a prophylactic measure against diatomaceous earth pneumoconiosis. At the moment, our thoughts concern only an experimental study to determine whether or not the measure would be effective. Until that study is completed, we are definitely adverse to using aluminum with human subjects.

As always,

Sincerely yours

Arthur J. Vorwald, M.D.
Director

AJV:bw

cc: Mr. J. P. Woodard - New York

C 11/14

F. The basic reason that the aluminum therapy process was patented was in order that adequate control might be maintained over its usage. An agreement for the use of this method includes:

1. an assurance that all possible dust control methods are being used and maintained,

2. that materials and dispersing methods conform to the requirements of the McIntyre Research Foundation,

3. a payment of $1.00 per year per man exposed is made to the Foundation, (The U. S. rate might vary slightly from this Canadian rate.)

4. Dr. Harmon of Washington, Pennsylvania is the U. S. representative through which installation arrangements will have to be cleared.

G. The U. S. and Canadian patents covering this therapeutical method are #[illegible]199, September 26, 1939, Canadian and #2,156,378, May 2, 1939, U. S. Both patents expire during the year 1952. No decision has yet been made as to what action the McIntyre Foundation will take at the time of expiration.

H. Mr. Ennis provided us with numerous papers and literature concerning the development and results of aluminum therapy. An additional reference is to be found in the studies and reports series F#13 International Labour Office, publication of the Silicosis Conference held at Johannesburg, South Africa August, 1930.

H. M. Jackson

HMJ:PO'H

Confidential

FCC

September 25, 1950

A. B. Cummins - Research Center

Industrial Hygiene - Lompoc
Aluminum Therapy

As mentioned at our meeting here on September 18, Dr. Lanza talked with Dr. Dudley Irwin about his experience in the aluminum therapy field and asked if we could get the information from him with respect to certain analytical techniques.

Dr. Irwin said he could be seen any time this week--Room 1930, Gulf Building, Pittsburgh, Pennsylvania.

It was the consensus among the group--Messrs. Fisher, Eisenbast, Vandiver Brown, Cummins, Lanza, Woodard, and Jackson--that the services of a research analyst would be required to get the necessary information and it was requested that you ask for the help of such an individual from Research.

I have told you of our brief meeting with the people at McIntyre Mines in northern Ontario and that we have quite a bit of information from them and samples to be passed over to you when you come in.

It is suggested that the individual whom you would choose to go to Pittsburgh make direct contact and arrangements with Dr. Irwin.

The minutes of September 19 by H. M. Jackson cover our meeting of September 18.

J. P. Woodard

bc: H. M. Jackson (10-4-50)

MEMORANDUM

General Headquarters
September 19, 1950

Industrial Hygiene Lenpos
Discussion September 18

A. R. Fisher
A. S. Eisenbast
V. Brown
Dr. A. B. Cumming
Dr. A. J. Lanza
J. P. Woodard
H. M. Jackson

1. Dr. Lanza reported on his conversation pertaining to aluminum therapy with Doctors A. J. Verwald and Dudley Irwin.

A. In Dr. Verwald's opinion, because of the linear pathology involved in diatomaceous earth pneumoconiosis, aluminum therapy might produce more favorable results with it than it has with silicosis. He recommended that animal experimentation of approximately one year's duration be employed to determine its effectiveness.

B. Dr. Irwin agreed with the thinking that aluminum therapy might prove more beneficial with diatomaceous earth pneumoconiosis but in his opinion animal experimentation was not necessary prior to administration to our personnel.

C. Although well controlled experiments and statistical facts are lacking, there is indication that silicosis in the Province of Ontario has been appreciably diminished through the use of aluminum therapy. Dr. Sheppore of South Africa is convinced that aluminum therapy is largely responsible for this result.

D. Dr. Irwin recommended that aluminum therapy be tried at Lenpos. Sufficient experience has been had to show that no harm is to be had from the inhalation of aluminum and there is a possibility of a favorable response. In his opinion, a metallic aluminum is better than the aluminum hydrate but he recommended that we conduct tests to determine which form of aluminum was more effective in reducing the solubility of our diatomaceous earth products. That which had the greater capacity for this would be the one which he would recommend.

In a general discussion, the following points were brought out.

1. Aluminum dust is not toxic. Considerable proof has been established that there is no problem in the manufacture of aluminum.

2. The experience at MacIntyre indicates that with aluminum therapy, the progression to the P3 stage takes a longer period of time and in many cases it does not progress to that extent.

3. In Dr. Irwin's opinion, aluminum therapy for our P3's would do no harm and might possibly do some good.

4. Dr. Lanza indicated that Dr. Irwin would be glad to discuss the problem with us and, in addition, review the details of analytical techniques with our research.

January 25, 1951

J. P. Woodard

Industrial Hygiene - Lompoc

I have noted the recommendations in your letter of January 22 to Mr. Fisher and I am entirely in accord with them.

L. C. Hart

cc: A. R. Fisher
Vandiver Brown
A. S. Eisenbast
(C. W. Hite
(H. M. Jackson

Confidential

January 26, 1[illegible]

J. P. Woodard

Industrial Hygiene - Lompoc

Personally, I am heartily in accord with the program outlined in your letter of January 22. Knowing the potential problems we have at Lompoc, it is important that we have and maintain a good understanding with the Pacific Coast doctors, as well as with the proper State officials, on this subject of dust at Lompoc.

Now that it has been decided to go ahead with the plan of using aluminum therapy, I cannot help but feel that there is a job to be done in selling or explaining this to the employees at Lompoc by the proper people, and I am sure Dr. Lanza can be of material help. I would think that the nature of this work is important enough for you to accompany Dr. Lanza.

A. R. FISHER

cc Vandiver Brown
A.S.Elsenbast
L.G.Hart
H.M.Jackson

December 8, 1950

A. S. Eisenbeat
V. Brown
J. P. Woodard
C. W. Hite

Aluminum Therapy

On November 9, the following items were discussed with Dr. Robson of the McIntyre Foundation:

1. Dr. Robson presented the background of the McIntyre Aluminum Therapy Program and covered much the same points as Mr. Ennis presented in our earlier visit.

2. He reviewed the original data on their experiments with control of solubility. Most of these facts are presented in "The Prevention of Silicosis by Metallic Aluminum", an article included in the material which was given us by Mr. Ennis. Their research indicated that the solubility of various types of quartz and other types of materials was reduced in varying degrees by aluminum powder. Comparing the effect on McIntyre quartz of the McIntyre aluminum black powder and the Sermaas X1010 aluminum hydroxide powder, they found that one milligram of the McIntyre aluminum resulted in an 87% reduction of solubility and 10 milligrams of the X1010 brought about only a 59.9% reduction in solubility. Their conclusion was, of course, that for their dust the McIntyre aluminum powder was considerably more efficient.

3. In Dr. Robson's opinion, the aluminum therapy had contributed to the control of silicosis but he was unable to indicate to what degree. For specific cases of marked control or improvement of silicosis, he referred to Dr. Hannon's work in Pennsylvania.

4. Dr. Robson permitted me to borrow and review his copy of the report of a Provincial Committee whose responsibility is the development of medical statistics on silicosis. This Committee was appointed in 1948 and the report covers their proposals for obtaining the statistics necessary to evaluate the silicosis problem. The report covers primarily the clerical procedures and mechanical methods for such fact accumulation. In March 1950, a Medical Statistics Unit was set up under the Workmen's Compensation Board. However, it will probably be several years before any data is available and until such time, there is no other source of information concerning the silicosis problem.

5. Dr. Robson also permitted me to review a report developed by their own Organization. The attached charts are excerpts from this report. In interpreting the data, it should be recalled that the introduction of aluminum therapy occurred in 1944.

   A. Table #1 lists the new cases diagnosed from 1941 to 1948 and shows the progression of these cases. Note that there are no new cases in 1947 or 1948. There is no such marked change, however, in the progression data.

   B. Chart #1 lists the new cases and status in the years when diagnosis was made. Note that there were no new cases from 1947 to 1950 to date.

C. Table #3 summarizes the cases diagnosed from 1925 to 1948 and indicates their status as of January 1, 1949. There does not appear to be any remarkable reduction in rate of progression on cases from 1944 to 1948 as compared to those prior to 1944.

D. Table #4 is a graphic representation of the British Columbia silicosis experience. It begins with the year 1937 when the compulsory ventilation control program by the Workmen's Compensation Board began. In 1944, aluminum therapy, also compulsory, was introduced into all the mines. A rather notable drop in new cases is evident.

From additional data in the report, I attempted to make a comparison of numbers of cases and their progression in the five year period 1939 to 1943 prior to and the five year period 1944 to 1949 following the introduction of aluminum therapy. This is labeled J-M Table #1 and indicates a reduction in new cases but fails to show a retarding of disease progression.

While the responsibility for the lack of statistical data is frequently laid to the inactivity of the Provincial Compensation Commission, in my opinion, that which the McIntyre Organization has shown us of their own experience is quite inadequate.

a. They offered no data pertaining to the relationship of length of exposure and progression of disease.

b. No indication of the relationship of numbers of disease cases diagnosed to total men exposed has been presented. Without such, the absolute tallies may have more or less significance than comparison of the raw data might indicate.

c. They have presented no comparison of experience prior or subsequent to the application of aluminum therapy.

Apparently the principal (and only?) basis for evaluating the efficacy of aluminum therapy is the reduction in new cases. As is generally conceded, however, engineering improvements, improved medical techniques and diagnostic procedures have had some part at least in the reduction of disease occurrence.

Although Dr. Robson felt that aluminum therapy was of definite value, he admitted that its evaluation was difficult and his enthusiasm was not as vigorous as that of Mr. Ennis. However, he was convinced that the program should be continued and expanded. He stated that Dr. Hannon had had experience with several cases that showed unusual control and improvement although he admitted that part of the effect might be psychological.

Dr. Tayler of the Ontario Workmen's Compensation Board at Timmins was also contacted. He repeated the fact that the Commission had no data concerning the effects of aluminum therapy and was reluctant to give even a personal opinion on its value.

H. M. Jackson

HMJ:PO'H
Att.

The views expressed on carcinogenic properties on the dust is of immediate interest and, in my estimation, make it all the more important that the laboratory work be carried out if for no other reason than to determine the relation between the actual results, so far observed at Lompoc, as compared to what we will develop in the laboratory dusting procedure. In this connection, certainly the writer is not very happy about having to depend upon the animal testing, as it has been carried out to date, but we are in hopes that as time goes on procedures and conditions will be established for the laboratory work, which will give helpful information.

Regarding a copy of the proposed Research Program, I see no reason why this should not be sent to you to obtain the added views of yourself and Dr. Anderson and I am attaching a copy of the program for your inspection. Will you kindly return it with your comments.

Arthur Eisenbast.

cc: J.P. Woodard

P.S.....Since writing the above, this subject has been discussed again with Mr. Woodard and I find that our medical advisers believe that the technique of making the carcinogenic test on the cancer bearing mice is so unsatisfactory at this time that they recommend strongly against such test. We will, therefore, not proceed with that part of the program at this time but are marking it up for review one year from to date. Mr. Woodard and I have discussed further the subject and will proceed with Dr. Verweld's program as presently laid out.

In addition, Mr. Woodard is getting in touch with Dr. Hannon and will make the preliminary and other arrangements necessary to start the aluminum therapy at Lompoc, which undoubtedly will entail a visit by Dr. Hannon to survey and institute such setup. You, Dr. Anderson and your staff, along with Dr. Hannon, will have to discuss where and how the therapy can most properly and satisfactorily be applied.

A.S.E.

TABLE NO. 1

McINTYRE PORCUPINE MINES, LIMITED

SILICOSIS SUMMARY

1941 to 1948 PROGRESSION

New Cases Diagnosed:	1942	1943	1944	1945	1946	1947	1948
Ante-Primary (A.P.)	5	0	1	3	4	-	-
Primary (P)	0	0	1	0	1	-	-
Secondary (S)	2	0	1	0	2	-	-
Total	7	0	3	3	7	0	0

Progressions:							
Early of A.P. to P.	1	0	0	2	3	0	2
A.P. to S.	2	2	4	2	4	3	1
P. to S.	1	0	0	3	1	1	2
S. to Deceased	4	1	3	1	2	3	1 (a)

(a) A.P. to Deceased - other causes

TABLE NO. 3

SUMMARY OF CASES OF SILICOSIS DIAGNOSED 1925-1948 AND STATUS JANUARY 1, 1949

Year Diagnosed	New Cases and Status then: Total	A.P.	P.	S.	F.	STATUS OF CASES JAN. 1, 1949: A.P.	P.	S: San.	S: Home	F.: Silicosis	F.: Other Causes	Unknown: Repat.	Unknown: Cancel	Total
1925	1			1						1				1
1926	33	24	5	4		2		0	9	14	2		6	33
1927	4	2		2						4				4
1928	-													-
1929	4	2		2					1	2	1			4
1930	4	4				1	1		1	1				4
1931	7	4	1	1	1	2			2	3				7
1932	6	5		1		1			2	2		1		6
1933	5	3		2		1			1	1	1	1		5
1934	3	3							2	1				3
1935	-													-
1936	1	1									1			1
1937	2	1		1					1	1				2
1938	2	2				1	1							2
1939	7	5	1	1		2			2	2	1			7
1940	3	2		1		1			1	1				3
1941	10	7		3		3			5	2				10
1942	7	5		1	1	2	1		2	2				7
1943	-													-
1944	3	1	1		1		1		1	1				3
1945	3	3					1		2					3
1946	7	4	1	2	0	4			3					7
1947	-													-
1948	-													-
	112	79	9	22	3	20	5	0	35	38	6	2	6	112

A.P. - Ante-Primary 20

P. - Primary 5

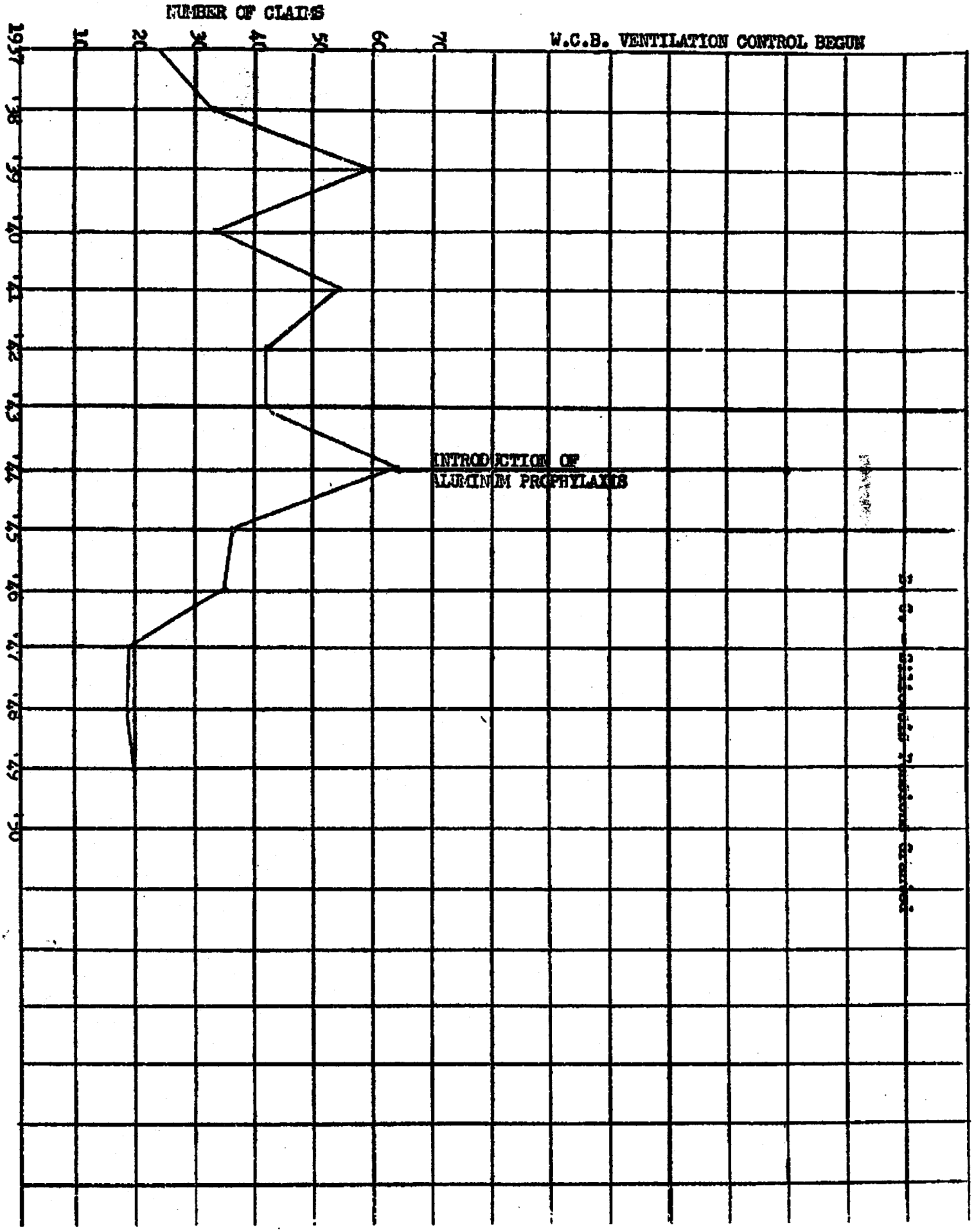
S. - Secondary 35

F. - Fatal 44

Unknown Cancelled 8

Total 112

TABLE #4


NUMBER OF CLAIMS
10
20
30
40
50
60
70
W.C.B. VENTILATION CONTROL BEGUN
INTRODUCTION OF
ALUMINUM PROPHYLAXIS
1937
38
39
40
41
42
43
44
45
46
47
48
49
50

JM CHART #1

Case Progression Comparison

	1939-43	%		1944-48	%	
A. P. - No progression	15	65		4	33	
A. P. to P.			82	2	17	67
A. P. to S.	3	13		2	17	
A. P. to F.	1	4				
P. - No progression						
P. to S.				2	17	
P. to F.						
S. - No progression	4	17		2	17	
S. to F.						
	23	100%		12	100%	

NOTE: Cases shown are those diagnosed within the years indicated, and progression is that which occurred within the five year period.

meeting 12/8

November 21, 1950

NOTE FOR FILE

Industrial Hygiene - Lompoc
Aluminum Therapy

Dr. Lanza is to talk with Dr. Vorwald tonight and discuss this subject.

(1) If we want to use aluminum oxide as an agent at Lompoc, we will need to work this through Dr. Hannon and, hence, will need to review this with him. Should this be done, it would be well to have Dr. Hannon come to New York for a meeting when Dr. Irwin is here on December 7.

(2) If we are not going to use aluminum oxide, but the material being produced by Saranac, there would be no need for meeting with Dr. Hannon, and possibly we wouldn't get into the business of carrying this out until after Saranac has completed their tests with aluminum hydroxide.

J. P. Woodard

THE TRUDEAU FOUNDATION
FOR
THE CLINICAL AND EXPERIMENTAL STUDY OF PULMONARY DISEASE

AT SARANAC LAKE, N.Y.
THE SARANAC LABORATORY
THE TRUDEAU FOUNDATION
THE TRUDEAU SCHOOL

OFFICE OF DIRECTOR
P.O. BOX 951
SARANAC LAKE, N.Y.

AT TRUDEAU, N.Y.
THE DEPARTMENT OF PHYSIOLOGY
THE DEPARTMENT OF BIOCHEMISTRY
THE DEPARTMENT OF RADIOLOGY
THE TRUDEAU LABORATORY

April 13, 1951

Dr. A. B. Cummins
Johns-Manville Research Center
Manville 1, New Jersey

Dear Doctor Cummins:

Will you please have shipped to us, as soon as convenient, another 100 pounds of Regular Flux-calcined Diatomaceous Earth (Hyflo Supercel) for the experimental program we are conducting for the Johns-Manville Corporation.

We are wondering whether you have been able to have made for us the electron micrographs of the diatomaceous earth labeled MD-94 and MD-95, which we sent to Mr. Woodard last December and which he, in turn, forwarded to you. We are very anxious to have these micrographs as we feel they will contribute to our knowledge of the action of these dusts.

Thank you for your letter of March 29 in which you advised that the colloidal aluminum hydroxide arrived in good condition.

Sincerely yours,

Arthur J. Vorwald, M. D.
Director

AJV:RH

CC: Mr. J. F. Woodard
Mr. A. S. Elsenbast

DMH

THE TRUDEAU FOUNDATION
FOR
THE CLINICAL AND EXPERIMENTAL STUDY OF PULMONARY DISEASE

AT SARANAC LAKE, N.Y.
THE SARANAC LABORATORY
THE TRUDEAU FOUNDATION
THE TRUDEAU SCHOOL

AT TRUDEAU, N.Y.
THE DEPARTMENT OF PHYSIOLOGY
THE DEPARTMENT OF BIOCHEMISTRY
THE DEPARTMENT OF RADIOLOGY
THE TRUDEAU LABORATORY

November 2, 1950

Mr. J. P. Woodard
Johns-Manville Corporation
22 East 40th Street
New York 16, New York

Re: Diatomaceous Earth Pneumoconiosis - Proposed Program for Testing Powdered Aluminum Hydroxide

Dear Page:

In answer to your letter of October 25, 1950, the questions posed may be answered as follows:

1. The 500 million concentration was suggested only because it would be a more severe test of the effectiveness of the powdered aluminum. This concentration is far below that which killed the animals in the early part of the current experiment. Should the powdered aluminum be effective with the concentration proposed, there would be every reason to believe that it would act similarly in human subjects accidentally exposed to higher concentrations of dust than currently present in the plant.

2. (a) Based upon our experimental work, we consider the powdered hydroxide to be superior to the metallic aluminum powder (McIntyre) as a therapeutic agent. For example, when quartz particles dispersed in a colloidal aluminum hydroxide suspension were injected into guinea pigs, the quartz failed to produce nodule formation or fibrosis; when metallic aluminum powder was substituted for the hydroxide and the experiment repeated, there was no protection and the nodular lesions typical of silicosis developed. It is conceivable that the difference in reaction may have been due principally to a better dispersion of the hydroxide in the suspending fluid. However, a limited series of inhalation experiments also tend to confirm the belief that the hydroxide is more effective than the metal.

11/9

(b) The aluminum hydroxide can be dispersed as a dry powder or as a suspension in liquid (not a true solution). In our experiments, we disseminated the powder in the form of a dry, finely-divided powder. Because of technical difficulties we prefer to disperse the material in the form of an aerosol derived from a colloidal suspension of the agent. This is accomplished by passing the agent through a critical orifice which will deliver the aerosol in the form of a mist containing submicroscopic particles which will remain suspended in the atmosphere. We have not found a significant aggregation or coagulation of such particles.

(c) We have not experienced a humidity problem in experiments where dust suspended in a liquid is being disseminated as an aerosol. This probably results from the fact that the volume of fluid dispersed is not high. However, the dry dust method could be substituted should humidity increase to an undesirable level.

We are looking forward to having you with us next Tuesday.

Sincerely yours

Arthur J. Vorwald, M.D.
Director

AJV:bw

cc: Mr. A. S. Elsenbast

THE TRUDEAU FOUNDATION

FOR THE CLINICAL AND EXPERIMENTAL STUDY OF PULMONARY DISEASE

SARANAC LABORATORY
TRUDEAU LABORATORY
TRUDEAU SCHOOL

OFFICE OF DIRECTOR
P. O. BOX 551
SARANAC LAKE, N.Y.

DEPARTMENT OF BIOCHEMISTRY
DEPARTMENT OF PHYSIOLOGY
DEPARTMENT OF RADIOLOGY

October 6, 1950

Mr. J. P. Woodard
Johns-Manville Corporation
22 East 40th Street
New York 16, New York

Dear Page:

Since your last visit we have given a great deal of thought to that phase of our discussion concerning aluminum therapy for Diatomaceous Earth workers. In fact, I had occasion to refer to the subject in a recent letter to Mr. Elsenbast.

You will recall, at the time of our discussion we expressed the view that, because of the character of the tissue reaction to inhaled Diatomaceous Earth, our Aluminum Hydroxide Powder atomized in the general plant area would be, in all probability, an effective prophylactic agent to prevent the development of Diatomaceous Earth pneumoconiosis. In view of the cellular nature of the tissue response, it is possible also that the Aluminum Hydroxide Powder will retard the progression of an established disease and even cause it to regress. These views are only tentative, however, since a very precise experimental study would be needed for verification. Pending such a study, we would hesitate to use the powder for workers exposed to the dust. It is possible that the Aluminum Powder might alter adversely the capacity of one or more of the components of diatomaceous earth to produce tissue damage. Furthermore, atomization of the powder in the general plant area might lead to a false sense of security.

The original estimate of $800. to $1000. was based only on the approximate cost of a chamber. It would be impossible to conduct the study at that figure. In this connection and in response to your request, we are submitting for your consideration a proposal summarizing the investigation we discussed.

With kindest regards,

Sincerely yours,

Arthur J. Vorwald, M.D.
Director

AJV:LB
Encs. (4)
CC: Mr. A. S. Elsenbast

September 28, 1950

Visit to McIntyre Mine
September 20 - 21

A. S. Eisenbart
J. P. Woodard
H. M. Jackson

Under the guidance of Mr. Larry Cooper of the McIntyre Mines, observation was made of the facilities for manufacturing and dispersing the aluminum dust. Dispersion is made in the change house approximately 15 minutes prior to the incoming shift. The aluminum powder is dispersed through an ejector valve under 100 pounds pressure. Ten one gram cans are used for each treatment and the dust remains in the air for approximately an hour and a half. The men are in the change house for approximately 10 minutes. In order to maintain adequate dust concentration, all room openings are well sealed. The aluminum powder is manufactured from chemically pure aluminum pellets milled to satisfactory dimensions in an aluminum lined ball mill. Particles of suitable size are drawn off by aspiration and packaged in one gram cans for shipment. — 95% less than 5 microns
90% " " 1 "

Mr. R. J. Ennis reviewed for us the background and details of the present program. The major points of this are:

A. Dr. Robson in 1922 made the observation that variations in time for the development of silicosis might be explained by the presence of antidotal rock. Numbers of experimental animals were placed in various portions of the mine and Dr. Irwin (now Medical Director of the Aluminum Company of America) did the pathological work. The McIntyre Research Foundation was formed to carry on the experimental work the result of which is the aluminum therapy method now employed by the Ontario Mines.

B. The McIntyre Mines has been administering the aluminum therapy for six years and at present there are more than 16,000 miners receiving treatment in the Province of Ontario. There have been no cases in which the aluminum dosage has caused difficulty.

C. The normal dosage is one gram of the aluminum powder per one thousand cubic feet. This produces a concentration of thirty-five thousand particles per cubic centimeter. This, converted to our U. S. unit of concentration, is approximately nine hundred and forty-five million particles per cubic foot.

D. It was estimated by Provincial authorities that there had been, in the last thirty-five years, approximately one thousand silicotics of which five hundred have received compensation at a rate of $14,000 per case. There are twenty-three cases in the McIntyre Mines at present. It has been the experience at McIntyre that continuance at work, even if a job has to be created for them, is considerably better than separation. The men are happy in their work and are considerably better off financially than they would be receiving compensation. It has been their experience that those men who do leave work die within a very short time. The psychological effect seems to be the principal factor of life prolongation in these cases. A special and individual method of administering aluminum dust to these cases is sometimes used.

E. A theory which is being pursued by research concerning the variance in individual susceptibility to silicosis is the relationship of the acidity of the environment to the individual's capacity for the absorption and elimination of silica through the urine.

COPY

THE TRUDEAU FOUNDATION
OFFICE OF DIRECTOR
SARANAC LAKE, N.Y.

September 26, 1950

Mr. Arthur Eisenbast
Vice President
Johns-Manville Corporation
22 East 40th Street
New York 16, N.Y.

Dear Mr. Eisenbast:

I am exceedingly sorry that I could not respond to your recent letter so that you might have some additional information for your discussion in Lompoc.

There is very little that I can say at the moment concerning the use of aluminum hydroxide as a prophylactic or therapeutic measure in diatomaceous earth pneumoconiosis. In view of our experience with free crystalline silica, and since the fibrosing agent in diatomaceous earth pneumoconiosis appears to be the cristobalite content of the dust, I would expect that the aluminum hydroxide would be effective as a prophylactic measure. It may even be useful for treatment of workers already having fibrosis in the lungs. In final analysis, however, it is impossible to state categorically that aluminum hydroxide will be effective pending a very precise experimental approach using animals exposed to the dust. I would certainly hesitate to use it clinically until some information with respect to the experimental results is at hand.

We are prepared to embark upon such an experiment, the design of which would be similar to those already under way with diatomaceous earth. The results of those experiments will serve admirably as controls. As mentioned during our discussion, the experiment will necessitate an additional chamber with dual apparatus for dispersion of the diatomaceous earth and the aluminum hydroxide. In consequence of that system, the conduct of the experiment will require very careful supervision. The investigation cannot be accomplished in less than twelve months' time.

The chamber and the necessary instrumentation will cost roughly about $1500. That being the case, we can undertake the investigation for approximately $4000. This is somewhat more than my original estimate of around $2500 to $3000.

If you wish to embark upon the study, I will be happy to develop a very precise proposal setting forth the details of the program we have in mind.

With kindest personal regards,

Sincerely yours,

Arthur J. Vorwald, M.D.
Director.

AJV LB

NEW YORK UNIVERSITY-BELLEVUE MEDICAL CENTER
OF NEW YORK UNIVERSITY
INSTITUTE OF INDUSTRIAL MEDICINE
477 FIRST AVENUE, NEW YORK 16, N.Y.
OREGON 9-3200

January 19, 1951

MEMORANDUM TO: Dr. W. N. Anderson
Dr. R. N. Smart

SUBJECT: For your information and to bring you up to date as to what has been going on with respect to the problem of dust in Lompoc.

After a great deal of discussion with the McIntyre Research Foundation in Canada and the Saranac Laboratory, it has been decided to try inhalation of aluminum dust for prophylaxis and possible therapeutic effects on selected employees in Lompoc. It is probable that Dr. Harmon of the McIntyre Research will come to Lompoc in the near future to discuss ways and means. I have had a number of conversations on this subject both with Dr. Vorwald and also with Dr. Dudley Irwin. As you may recollect, Dr. Irwin was one of the original group of the Connaught Laboratory that worked under Banting. You may also remember that sometime after he had produced insulin he was requested by the authorities in Ontario to investigate the subject of silicosis and he and his co-workers finally came through with the treatment based on the inhalation of aluminum dust.

While there has been a great deal of pro and con discussion on the subject of the use of aluminum dust and while it is true that there still remains much to be determined, two things are clearly evident at the present time: 1) The incidence of silicosis in the Ontario gold mines has steadily decreased and this decrease cannot be ascribed to dust control; therefore it would seem that a certain amount of credit must be given to aluminum. 2) Experience with the administration of aluminum has not shown it to cause any harmful effects.

Both Dr. Vorwald and Dr. Irwin (who is now Medical Director of the Aluminum Company of America) feel that the type of pathology produced by diatomaceous earth might react more favorably and more rapidly to aluminum than does silica. They admit that this is purely a supposition but it is an interesting comment because Dr. Irwin and Dr. Vorwald do not always agree with respect to various essentials in pneumoconiosis.

It is felt that the somewhat isolated position of Lompoc and the size of the plant may possibly lend themselves to a control demonstration that may be of very great benefit to the whole subject of

pneumoconiosis. There are many divergences of opinion among the authorities who work in this field and probably there always will be but I feel quite sure that all of us stand to gain substantial knowledge.

As far as I know there are no other research projects stemming from Lompoc that are under consideration at the present time.

I will endeavor to keep you informed as to what goes on. If there are any questions you have in mind, do not hesitate to write to me.

With best regards and best wishes, I am,

Sincerely yours,

A.J. Lanza, M.D.

AJL:le

Industrial Hygiene Lunch
Discussion September 18

Decisions

1. Dr. Lanza will contact Dr. Irwin to determine when it will be convenient for our Research analyst to visit him.

2. After the analysis has been completed, decision will be made as to whether aluminum or aluminum hydroxide will be used.

3. A visit will be made to the MacIntyre group to observe their set-up and administrative problems.

H. M. Jackson

HMJ:FO'H

CONFIDENTIAL

July 17, 1950

MEMORANDUM TO: A. S. Elsenhart
A. B. Cummins
J. P. Woodard

Industrial Hygiene - Lompoc
Sorensen Program

The following notes were made when Messrs. Elsenhart, Cummins, and Woodard were at Sorensen on Thursday, June 29.

These three met with Ed Urban, Dr. Pratt, Tom Durkin, Mr. de la Hunt, and Dr. A. J. Vorwald.

I. Dr. Vorwald stated that another Interim Report would soon be issued giving data on the results of the program to date.

II. Inhalation Tests.

A. Tests started maintaining an atmospheric contamination of about 500 million p.p.cu.ft. for the three Celite materials being used, i.e., Regular Flux Calcined material, Special Flux Calcined material, and Filter-Cel.

This concentration seemed excessive in that very bad effects were shown by some of the groups of animals and it was considered too high to be a proper test.

Accordingly, about January 1, the tests were changed and attempts made to maintain a concentration in the neighborhood of 150 million p.p.cu.ft. Tests of the atmosphere recently showed the following counts in the dust chambers:

Regular Flux Calcined	169 million p.p.cu.ft.
Special Flux Calcined	156 " "
Filter-Cel	151 " "

Other tests later mentioned have indicated that the smaller size particles are probably most damaging. Inasmuch as Sorensen can now control the particle size, the tests are now run with mainly fine particles. It was stated that the medium size is now 1½-2 microns with no coarse material.

III. Tests on the materials showed the following results:

A. Regular Flux Calcined (the parent material) showed:

Quartz	1%
Cristobalite	40%, plus or minus

Tests on the fine materials caught from the air showed:

Quartz	0%
Cristobalite	75%, plus or minus

B. Special Flux Calcined (the parent material) showed:

Cristobalite 70%, plus or minus

Tests on the fine air-borne materials showed:

Cristobalite 77%, plus or minus

It will be noted that the Cristobalite content in the fines is very high and about the same from both parent materials. Dr. Cumming commented that this is not surprising. The conclusion would be that air-borne material, therefore, from either parent material would be equally toxic.

IV. It was felt that we should consider the advisability of having Sarnano run inhalation tests at some lower concentrations, such as 15-40 million, in order that they may be more comparable with the conditions a man in the plant might encounter on a very dusty job. This will be determined after we have seen Sarnano's next Interim Report and have reviewed the record of counts at Lompoc as shown in our periodic reports from Lompoc on dust counts. The objective would be to try to determine some threshold limits.

V. Dr. Vorwald and Dr. Pratt gave the following information on the effects on animals that have been sacrificed after undergoing certain inhalation tests:

A. Natural Uncalcined Earth.

1. Animals exposed to 500 million particles for 8 months.

a. There was a marked thickening of the nodes.

2. Same exposure with tuberculosis-infected animals.

a. The tuberculosis was activated.

B. Special Flux Calcined.

1. Animals exposed to 500 million particles for 8 months.

a. There was extensive damage with much fibrosis. The fibrotic condition was estimated as 3 to 4 times as great as in the case of Natural Earth in A above.

2. Same exposure with tuberculosis-infected animals.

a. The condition of these animals was also considerably worse than in A above.

C. Regular Flux Calcined.

1. The results were, in all respects, about the same as in the tests run with Special Flux Calcined mentioned in B above.

VI. The following information was given on injection tests:

Animals were given 20 doses over a 2 months' period, totaling 1 gram of material injected. Particle size was 1 to 3 microns. Some of the animals have been sacrificed, with results as mentioned below, while still others are yet to be checked:

A. Special High Purity Natural Earth (this was "washed" material specially prepared at the Laboratory):

1. In 1 month, there were noticeable lesions and it was stated that this appeared to be as bad as the results of Quartz injections. Incidentally, Dr. Vorwald mentioned the result with the Special High Purity Earth was about the same as with the Regular Natural Earth.

B. Special Flux Calcined:

1. All the animals died in 4 months from effects on the lungs and livers.

VII. Sarason mentioned there now appears to be indication that aluminum therapy as an inhibitor may be quite effective. It is still thought that metallic aluminum may in itself be harmful to the lungs. The present idea is to inject aluminum hydroxide into the air in liquid form. This could be done in the work areas, which would eliminate the special rooms some companies have been using where men are required to spend a certain period each day and where aluminum particles are injected into the air. Ed Urban made the comment that the effectiveness of this method can be questioned since it is difficult to get men regularly to spend time in these rooms, whereas if the aluminum hydroxide in liquid form is effective and if it is used in the work areas, there would not be this problem.

Sarason considers it might be advisable to set up one chamber for an animal inhalation test using 150 million p.p.cu.ft. plus the aluminum hydroxide. This would give data comparable with the tests now being run without the aluminum hydroxide.

It was thought that the test might be run with Regular Flux Calcined for a minimum time of 8 months, and possibly 1 year. An additional chamber would be needed that would cost from $800 to $1,000. We would be asked to consider supplying the chamber for this test and we agreed to do so.

VIII. It was agreed that Dr. Vorwald will propose a plan for the test mentioned in VII above, with Regular Flux Calcined and aluminum hydroxide. The plan would describe what he thinks should be done, when, probable duration, and cost.

J. P. W.

CONFIDENTIAL

AIR MAIL

A. S. Eisenbast, DHQ Box 91

Lompoc Plant
March 13, 1951.

Dr. J.h.G.Hannon
McIntyre Research Foundation
6 South Main Street
Washington, Penn.
Visit to Lompoc Plant

Dr. Hannon called me on the telephone Saturday afternoon, March 3, 1951 from Sherwood Lake(near Thousand Oaks) Los Angeles Calififfornia. HeHad arrived in Los Angeles sometime Saturday morning. I asked him about his plans, and suggested that he immediately call Dr. Smart. Dr. Anderson went to Los Angeles the same day and he and Dr.Hannon had a meeting in Dr. Smart's office Sunday March 4.

Dr. Hannon called me Monday and said he had planned to visit the Dicalite Plant before coming to Lompoc, but their Plant was shutdown for repairs and his trip to Lompoc would, therefore, be delayed from his original plans from Wed. Mar. 7 to Friday March 9. He informed me later that the Dicalite Plant was not operating while he was there, but he did see their packing operations.

I met him at Santa Barbara,(on the Daylight train) Friday morning and immediately returned to Lompoc. I showed him our stripping and quarrying operations, crushing plant, Powder Mills, sackroom, E&M shops , Brick Plant, and our wash and locker room.

During this trip I discussed all of the Dust Abatement projects that had been put in operation during the last four years.

Mr. Legge was with us during the tour of the plant.

We then returned to my office and discussed the'Aluminum Theraphy'program of the McIntyre Research Foundation. Dr. Hannon left some literature with me, part of which is to be returned to him.

He also requested prints showing the plans and elevation of our new locker room, and also the new building that we plan to install for the Quarries & Mines Department. I will send these prints to him today.

Dr. Hannon stated that he planned to write a report of his visit here and to submit his recommendations to you by the end of this week (March 17).

O. B. Westmont

cc- J.P.Woodard, DHQ Box 91 (Confidential)

file

SUT0005 0660

Department of Health, Education, and Welfare
Public Health Service
Bureau of State Services

II. RESEARCH PROJECT REPORT OF PROGRESS

Date: July 1956

1. DIVISION . . . . . Special Health Services
2. BRANCH . . . . . Occupational Health
3. PROGRAM . . . . . Occupational Health

4. DIVISION PROJECT NUMBER SHS-OH-2

5. PROJECT TITLE . . . . . Health hazards in the diatomite producing industry

6. INVESTIGATOR . . . . . Lewis J. Cralley and W. Clark Cooper

7. LOCATION OF PROJECT . . . . . Lompoc and Walteria, California; Clark, Nevada; and Terrebonne, Oregon.

8. STATUS . . . . . Operational

9. PARTICIPATING ORGANIZATIONS . . . . California, Oregon, and Nevada health departments

10. PRINCIPAL RESULTS . . . . . At the request of Dr. William Clark, Bureau of Adult Health, California State Department of Public Health, a conference was held in Berkeley, California, February 9, 1956, to discuss the Progress Report which was completed 1/1/55 covering the first two years of the diatomite study. Representatives from the Great Lakes Carbon Corporation, Johns-Manville Corporation, State Department of Industrial Relations, State Department of Public Health, and our Occupational Health Program were in attendance.

Plans were drawn up including covering letters for follow-up observations including periodic x-rays of designated persons (both in and out of the industry) and routine dust evaluations in the plants participating in the study. Some of this material is already being received, i.e., x-rays on in-plant personnel and dust evaluation records.

Lompoc diatomaceous earth

46

Fiber Litigation

Lompoc Plant - Health & Safety

S.F.

LOMPOC

and the

DIATOM

The story of how the men and women of Johns-Manville have built an important and stable industry in the "White Hills" of California

Servant to Man

SOMEWHERE a doctor gives a new "wonder" drug to a sick, feverish child. Within a matter of hours the child is on the way to recovery.

An American soldier serving abroad in the tropics draws drinking water from a portable filter and knows that it will be clean and pure and will not give him tropical diseases.

A housewife saves time and effort with a new polish which leaves her windows and silverware gleaming.

A highway maintenance man paints a white line down the middle of the road. It will provide greater safety through being brighter by day and by night.

A mechanic applies insulation to an industrial high-temperature furnace which will produce metals to aid in national defense.

You help yourself from a bowl of pure white sugar.

* * *

These may seem to be chance glimpses of everyday life. But there is a strong common thread that binds them together.

That common thread is a mineral substance called diatomite, the fossilized remains of microscopic plants known as diatoms.

Research over many years has found a thousand and one ways in which this little known material, a pure form of silica, can be made a servant to man.

Lompoc Highlights

JOHNS-MANVILLE'S deposit of diatomite (or ®Celite as J-M calls it) at Lompoc is the world's largest, purest and most uniform.

Almost pure silica chemically and with unique physical properties, Celite products have proved of great service to mankind in a thousand and one ways.

Increasing demand for these products makes necessary continuing expansion of operations at Lompoc. Only recently equipment was added increasing production of many of the most important products by more than one-third.

In this largest diatomite mining and processing plant in the world a large number of men and women have built careers of many years with Johns-Manville.

J-M provides employment for about 650 members of the Lompoc Valley community. The annual payroll is $2⅔ million.

There is a continuing program to improve working conditions and to safeguard the health of employees. The company has already spent $1 million on improvement of working conditions and is spending substantially more.

At the present rate of production, the Celite deposit will last perhaps a century.

Since the Celite deposit began to be worked more than half a century ago, the population of Lompoc has grown from 1,000 to 6,500.

(Opposite page) Aerial view of Johns-Manville's extensive diatomite quarries and mills at Lompoc.

The Diatom Is Put to Work

THE development of the Lompoc Celite deposit is a romance of the rapid rise of another California industry.

It is a fine example of how experimentation, research and imagination, backed by the money of investors and operating under the American economic system, can transform a material which is valueless in the ground into products of great use to mankind. And at the same time jobs and livelihoods are created for hundreds of thousands of men and women.

Up until 1893 Francis S. Balaam, who owned the "White Hills" on the outskirts of Lompoc, thought they were not worth the taxes he paid on them. The best use that had been found for the crude diatomite

1903

A small hillside quarry of fifty years ago (left) was the forerunner of J-M's extensive Celite quarries of today. View at right shows only a portion of the present workings.

was to make fire lighters by fastening a wire to a chunk of it and soaking it in coal oil.

One of these fire lighters came into the hands of a San Francisco manufacturer of pipe and boiler insulations. He became interested in the substance as a possible insulation and in 1893 ordered an experimental carload.

Two of Mr. Balaam's sons filled the order by digging the diatomite out of a bluff with hand tools.

In the following years several thousand tons of the diatomite were quarried and shipped. There was very little equipment to speed the operation. Since there were no facilities to cope with heavy overburden, locations were chosen where the crude material was near the surface.

The thin overburden was removed by a mule team and a scraper. The crude was then taken out in chunks and piled in rows for drying in the sun to remove the heavy moisture content. When ready for shipment it was hauled to town by wagon and loaded into freight cars by hand. The whole operation, from quarrying to shipping, was by hand.

In 1902 George B. Hannaman purchased a portion of the Dimock ranch to the north of the Balaam property and started mining operations there under the name of The Magnesite-Silica Company. By 1905 the Magnesite-Silica Company had purchased adjoining ranches including the one owned by Balaam, thus bringing under one ownership the major portion of the diatomite deposit. In the same year the company built its first plant in Lompoc for producing diatomite in powder form.

Development of the deposit was very slow until 1912, when it was taken over and operated by the Kieselguhr Company of America. In 1916 the name was changed to Celite Products Company, which later became the Celite Company.

In 1928 Johns-Manville acquired the property from the Celite Company. The next twenty years were the era of expansion and increased use of mechanized equipment to make work easier. As an example, in the quarries a new-type loader, which in effect is a continuous shovel, is capable of handling 1,200 cubic yards of diatomite per hour. The largest power shovel previously in use at Lompoc handled only 450 cubic yards per hour.

Research and diligent work of salesmen and sales engineers have found more and more uses for Celite products and increased production has been made necessary by the increasing demand for the material.

Today Celite is processed into powders, aggregates, bricks and other forms and sizes which have countless uses. These include filter aids for clarifying such materials as sugars, beer and other beverages, dry cleaning fluids, oils and chemicals; fillers for paints and varnishes, soaps and polishes; and high temperature insulations for industrial furnaces and kilns.

Portable water filters using Celite filter aids and weighing less than one-fifth as much as bulky equipment previously in use were developed and used during World War II by the U. S. and British armies and navies. They provided for the first time safe drinking water for armed forces in the field. This new system of filtration with Celite filter aids is now used to protect the health and lives of U. S. and allied servicemen.

A rapidly growing and completely new use is in filter aids for clarification of the new wonder drugs—the sulfas and the antibiotics such as penicillin, streptomycin, terramycin and aureomycin—which serve the public so well in saving life and preserving health.

Horse-drawn wagons and hand loading operations of 1905 (left) contrast sharply with the mechanized equipment in use today. This special loader (right) can handle 1,200 cubic yards of diatomite an hour. It can load the huge dump truck shown in 29 seconds. Cabs of both loader and truck are fully enclosed to prevent entrance of dust.

J-M's Operations Today

AN observer would see little similarity between two men working by hand in 1893 and J-M's completely mechanized operations today.

Present mining is done largely by open quarry methods. Heavy duty bulldozers, power shovels, loaders and trucks remove the overburden and carry the crude Celite directly to storage "glory holes" which are also vertical shafts located directly over a main transportation tunnel.

When needed the crude is drawn from the bottom of the glory holes and dropped directly into cars of an underground electric railroad for haulage to the mills.

The first step in processing is to crush and powder the soft crude rock in a special type of hammer mill which reduces it to a powder with lumps no more than ½ inch in size. The wet powder, with moisture content running up to 55%, then passes through a special drying system where it is thrown into a current of heated air and the moisture "flashed" off. Moisture content is reduced to 5% and at the same time the material receives a milling which eliminates all lumps.

In the early days lumps of crude were piled by hand in long rows and drying was done by the sun. The operation had to stop in the rainy season. The present driers have provided year-round quarry and mill operations and much more stable employment.

At this point the powder is ready either for further processing or for bagging and shipping to fill requirements for the dried powdered mineral in its natural state.

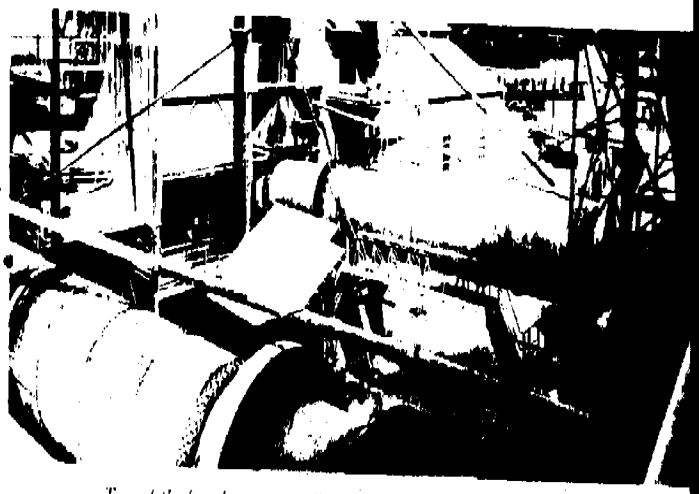
The bulk of the natural powder is further processed by heating or calcining in huge rotary kilns to various temperatures up to 2,000°F. The powder is then milled again and given air classification to produce a variety of powders with different particle sizes.

To make insulating brick for uses such as in steel mills, certain grades of crushed crude are pressed into bricks and special shapes and burned in a continuous tunnel kiln at 1,800° to 2,400°F. J-M's trade names for these products are *Sil-O-Cel C-22, Sil-O-Cel 16L and Sil-O-Cel Super Bricks.

The most recent expansion is a new calcining unit which raises productive capacity for fast flow rate Celite filter aids and for fillers by more than one-third. The heart of the new system is a large rotary kiln ten feet in diameter and 100 feet long. This system is an entirely independent unit. Like three other units at Lompoc, it produces some twelve different grades of products varying in particle size and composition to meet the increased postwar demands of world-wide industry.

Over the years millions of dollars, representing the savings of thousands of individual shareholders in the company, have been invested in the elaborate equipment required for efficient operation at Lompoc.

As producton of Celite has increased, more and more jobs have been created. From two men working the deposit more than half a century ago, employment has risen to about 650. A large number of these men and



Two of the four huge rotary kilns in which diatomite is heat processed at temperatures up to 2,000°F.

women have built careers of many years with Johns-Manville.

J-M's annual payroll at Lompoc is now about $2⅔ million.

Over the years the number and type of benefits available to employees have also increased. These "extras" include vacations and opportunity to participate in retirement, group life insurance and hospital-medical-surgical plans for which the company pays a substantial part of the cost.

These "extras" along with other programs of direct advantage to employees cost on the average about $450 each year for each employee over and above the amount paid for work performed.

In addition, hundreds of dollars per year per employee is being put into improving working conditions at the Lompoc plant.

This chest X-ray machine is typical of equipment in the clinic J-M maintains at the Lompoc plant. It is the best which has been developed. Employees receive regular examinations in the clinic.

This mobile vacuum system used to clean dust from warehouse floors and paved areas was designed and created by Johns-Manville engineers, since no equipment of this type is manufactured by suppliers.

Employee Health and Safety

JOHNS-MANVILLE conducts a long-range health and safety program to safeguard the health of all its employees.

A complete, up-to-date clinic is maintained at the plant under the supervision of a doctor who is a specialist in industrial hygiene. With a full-time nurse in attendance, the clinic is equipped for all normal hospital needs except for major surgery, which is performed in a hospital in Lompoc.

Thorough pre-employment physical examinations, including chest X-rays, are given all applicants for jobs. Re-examinations and medical advice are given annually or oftener to all employees.

An intensive safety program is in operation under the direction of a safety engineer bringing to the plant the most up-to-date safety techniques.

A new Blue Cross health plan, towards which the company pays half the cost, has been made available for the care of employees' families as well as themselves.

A very important part of the general health program is the elimination of dusty conditions, which are a problem here as in all mining operations. At Lompoc the end products, Celite powders, are actually dusts themselves.

Until 1924 operations at Lompoc involved handling diatomite only in its natural state. There were no known cases of damage to health.

Since 1924 processes have been developed to make new products by calcining or heat processing the natural powders. The heat treatment

increases the content of crystalline silica in the powders and the crystalline constituents are considered to be a source of a greater health hazard.

It is a relatively recent medical finding that continuous exposure to high concentrations of calcined diatomite dust can be harmful to health.

Johns-Manville proceeds under the principle that any dust is bad and its goal is to make operations as dust-free as possible. The company

A Roto-Clone, part of the system of wet dust collectors which is one of the most important accomplishments in J-M's extensive program to control dust throughout its operations. Fine residual particles of diatomite contained in combustion gases and steam from processing are here removed from the vapors as they pass through a curtain of water. Heavier particles are first removed by settling in a huge chamber excavated in the hill beneath the Roto-Clone.

Ventilating "bag-house" where air from the ventilating system in the plant is discharged into fifty-foot-long stockings, such as shown here, which collect dust just as does the bag on a home vacuum cleaner. There is a series of banks of these stockings at various locations throughout the plant.

conducts a continuing, long-range dust elimination program on which $1 million has been spent to date and substantially more is being spent to speed completion. The best engineering services obtainable, both from within the company and from outside sources, are engaged on this program.

Measures taken under this program include use of elaborate Roto-Clones or wet dust collectors; a special "bag-house" at the end of processing where the last powders are removed from exhaust gases by filtering through long cloth "stockings"; other baghouses, called ventilating baghouses, where air is pulled in from working areas in the plant and filtered; a mobile truck with specially designed vacuum equipment to clean dust from floors and to eliminate hand sweeping; improved handling and bagging equipment in the mills; fully enclosed "filtered air" cabs on trucks, bulldozers and other vehicles in the quarries; continual watering of roads in the quarries; and paving of plant areas.

For many years Johns-Manville has carried on intensive medical research on the effects of diatomite dust on health. Investigations were started in 1936 at the Saranac Laboratory of the Trudeau Foundation, Saranac, N. Y., to study the effects of Celite powders on animals subjected to high concentrations (much higher than employees experience) over long periods of time. The work proceeds slowly because very long periods of time and excessive exposures to the dust are required to produce pathological changes.

The fullest cooperaton is given to all agencies concerned with public

health to the end that medical knowledge on this subject may be expanded as rapidly as possible.

It is a part of employee training to give instruction in good housekeeping for prevention of dust and dirt accumulation in working areas. Maintenance men are taught to make repairs and adjustment to prevent the escape of air containing diatomite from conveying lines, packers and other machinery. Employees are given instruction in wearing respirators and other protective devices where there are dusty conditions.

Diatomite powders affect the lungs only after long, continuous exposure. For this reason J-M must be and is careful to protect employees from such exposure.

Improvements in working conditions and dust control which have been or are being made should now eliminate almost completely any health hazard in the plant.

Extensive measures have been taken at bagging stations such as this to control and carry away air-borne particles of diatomite which may escape as the finished materials are bagged for shipment. Dust is carried away through flexible vacuum tubes and through a ventilating system covered by the grillwork seen overhead. Employees must wear respirators wherever there may be dusty conditions.

Johns-Manville and the Community

WHILE the mining and processing of diatomite is the largest single industry of a manufacturing nature in the Lompoc community, the area is known for the quality of fruits and vegetables produced and shipped and is the nation's center of flower seed production. Many of its present ranches were established during the days of Spanish reign.

During the past half century the city has grown from about 1,000 persons to 6,500.

Rapid growth of the city, particularly since World War II, has greatly stimulated the demand for housing. To help meet this demand Johns-Manville has built a considerable number of houses for rent or sale to employees. The company also encourages and assists others in providing homes. Groundwork done by J-M enabled a contracting firm to begin construction in 1952 of a housing development of 172 units.

Most of Johns-Manville's annual payroll of $2⅔ million, of course, is spent in the community, helping to support not only J-M employees and their families, but also merchants and other businessmen who provide livelihoods for their own employees and families.

In addition, the plant spends about $2½ million a year for services and supplies purchased locally and throughout the State. Four other Johns-Manville plants in California also contribute to the economy of the State. These four are in Los Angeles, Watson (Long Beach), Redwood City and Pittsburg.

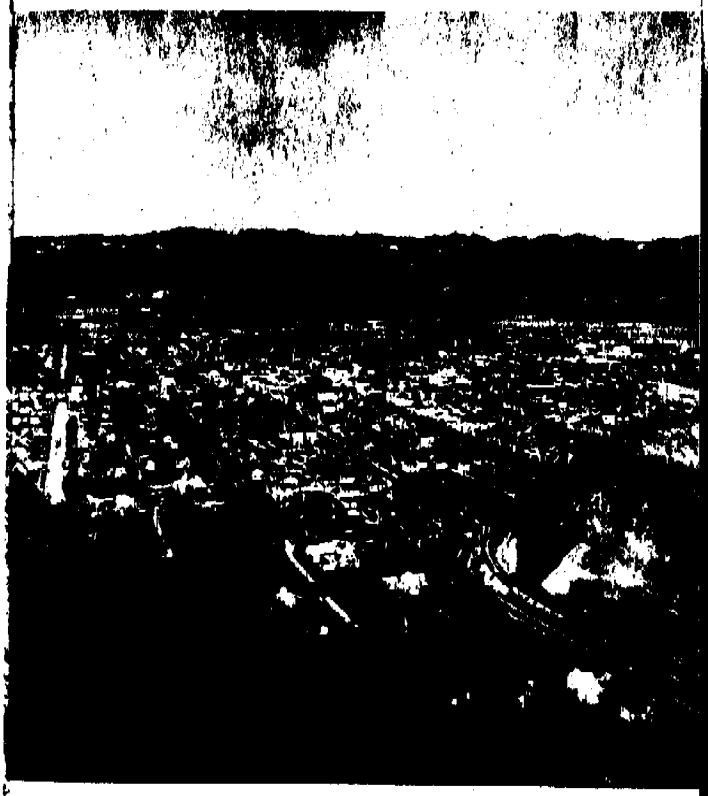
Stability of the operations at Lompoc is greatly increased by the strong financial position of Johns-Manville and by the experienced sales and research organizations provided by the company to encourage expansion of markets for Celite products and development of new products.

Throughout the United States and Canada, Johns-Manville employs 21,000 persons at twenty-two mine and plant locations and in sales offices in principal cities.

The company manufactures more than 400 lines of products comprising more than 20,000 different items.

Company-wide sales total about a quarter of a billion dollars yearly.

Looking towards Lompoc's future, demand for Celite products is growing constantly. J-M's Lompoc or "White Hills" deposit is a valuable natural resource large enough to make possible continuance of operations here at the present rate for perhaps a century.



View of the Lompoc community from a hill south of the city.

"Grass of the Sea"

THE diatomite which forms Lompoc's "White Hills" is made up of the fossilized remains of tiny marine plants that lived and died millions of years ago.

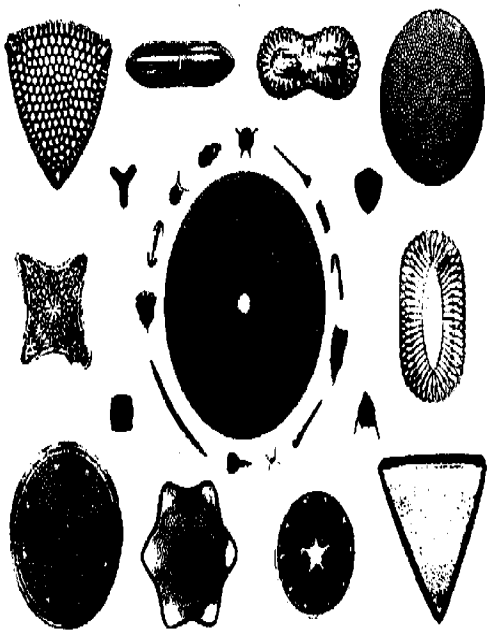
These tiny plants are diatoms. They are microscopic, single-celled organisms. They are characterized by the secretion of a shell consisting of two parts or valves of silica which enclose the living cell.

These valves differ widely in size, shape, structure and markings. The diversity of forms and shapes, intimate markings and figurations, and the symmetry and beauty of design have intrigued and fascinated men since their discovery over three centuries ago when the Dutchman Anthony Van Leeuwenhoek, known as the "father of scientific microscopy," first observed them through a microscope of his own making. To date some 8,000 to 10,000 forms have been identified. It would take 2,000 of them laid end to end to measure an inch.

Diatoms serve as a source of food for the higher and larger organisms. The amoeba and many other forms of aquatic life even up to the small fishes eat diatoms. For these reasons they have been called the "Grass of the Sea."

When a diatom dies it sinks to the bottom where, if it escapes being eaten, the organic content decomposes, leaving only the hard, mineral valves. These may form under favorable conditions a fossil sediment which, if elevated above water at a later period, becomes a deposit of diatomite.

These deposits are generally distributed throughout the world. Most of them, however, are not commercially important because of small size,



Jewel-like skeletons of diatoms which form the diatomite deposit at Lompoc are enlarged about 2,000 times in these photomicrographs.

impurities, non-uniformity, unsuitable form of diatoms or unfavorable location. To date by far the largest, purest and most uniform deposit ever discovered is the one Johns-Manville now owns and works at Lompoc, California.

This Lompoc deposit is of marine or salt water origin as differentiated from deposits formed in fresh water lakes. It was laid down in the Miocene period, some fifteen million years ago. Then the California coast line was in an active, formative stage with a continuous rise of land levels. Undoubtedly the peaks of the mountain ranges formed a group of islands which sheltered bays of relatively low depth and quiet waters. Here diatoms grew prolifically.

During a period of many thousands of years the diatomaceous sediment was building up on the bottom of the sheltered area, slowly but persistently, until it eventually reached the thickness of some 1,400 feet.