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1925	New York State	Asbestos. Fibrous tremolite, or brittle asbestos, is not uncommon in the walls of the talc mines.
1933	Dreesen	Breathing tremolitic talc leads to chest x-ray changes
1942	Schultz	Talc high in tremolite content is in a special class and exposures should be kept at lower levels than with other talcs examined. It is a well known fact that whenever talc is used as a dusting agent, workers may be exposed to large amounts of dust.
1942	Porro	Ogdensburg, NY, 30 miles from Gouverneur NY. Reports 15 cases of disabling, permanent and fatal talc lung diseases. Notes the similarity between asbestos lung disease and talc lung disease.
1943	Greenberg	Talc is fibrous and tremolite containing. Animal experiments produce little if any disease. Studies of people show serious disease. Fatal disease in downstream talc user. Notes similarity to asbestos lung disease.
1948	Vanderbilt	Buys Gouverneur talc mine
1952	Saranac	3 people from Gouverneur Talc Company attend; asbestos lung disease, asbestos cancer and talc disease all discussed.
1955	Schepers	Director of Saranac Lab. Autopsy study by researchers in Northern New York State. Fibrous talc causes asbestos like disease. Asbestos bodies measuring 20 μ to 50 μ long in fair abundance in lung tissue. New York State talc causes disabling and fatal lung disease.
1955	Kleinfeld	Breathing talc causes disability and death. Marked pleural injury noted on x-rays. X-ray picture has close resemblance to that of asbestos lung disease. Asbestos bodies are invariably present in cases of talc lung disease. Progression was seen in all the workers studied.
1959	Reddin	Exposure to NYS talc causes permanent, progressive, disabling and fatal disease. St. Lawrence County talc dust worse than that from a different county. Fibrous talc is more pathogenic than other talc that is not fibrous.

1962	Engle	"As may be seen under the microscope, the alteration of tremolite begins commonly with the growth of fibers of anthophyllite, or of both anthophyllite and talc along cleavages of the tremolite" "Slip-fiber, and more rarely cross-fiber, serpentine occurs along a few shear surfaces and joints." "The foliated talc and the fine-grained lustrous talc are almost invariably associated with fibers of both anthophyllite and tremolite." "The tremolite in the talc belts commonly forms elongate prisms, flattened blades and needles, or fine fibers, stubby laths, or almost equant grains." "The anthophyllite fibers thus lie in the direction of maximum shear and slickensiding (the A structural coordinate) rather than parallel to axes of rotation (the B structural coordinate). "This relationship is further indicated by the formation of some fibrous serpentine which forms slip-fiber asbestos along the shear surfaces."
1963	Kleinfeld	Autopsies of six workers exposed to dust containing talc admixed with tremolite and anthophyllite. Disease is progressive, disabling and fatal. X-ray changes exactly the same as seen in asbestos lung disease. Asbestos bodies found in lungs of each person at autopsy. All died of lung and pleural disease caused by "talc" from upstate New York.
1966	Vanderbilt	50th anniversary issue. Note the dominant shapes are fibers, rods, plates and irregular nodules.
1967	Kleinfeld	Cancer of the lung and pleural shows an overall mortality from cancer of the lung and pleura of approximately 4 times that expected.
1967	Kleinfeld	Talc is of the fibrous variety; causes progressive, disabling and fatal diseases; pleura is severely affected; cancer of the lung and pleura 4x expected.
1972	OSHA	OSHA standard regulates asbestos fibers
1972	OSHA/ACGIH	Exposure limit - fibrous talc - use same limit as asbestos.
1972	Vanderbilt	Vanderbilt no longer says that its industrial talc contains "fibers" - Instead says "the tremolite we find in our ores consists of a mixture of nodules, rods, plates and needles."
1973	Johns Manville	1/25/73 - Internal JM discussion of Vanderbilt talc activities. Discussion of the pitfalls and errors in Vanderbilt's thinking. It was concluded that the attack on tremolite vs. Chrysotile must be medically oriented as opposed to a simple fiber definition or redefinition.
1974	Kleinfeld	Mortality experience among talc workers, follow up. Cancer of the lung and pleura is approximately 4 times that expected.
1974	Rohl	Asbestos in Talc. The talc deposits of the Gouverneur District of New York State, talc occurs with the asbestos minerals chrysotile, tremolite, and anthophyllite
1974	Vanderbilt	12/2/74 Asbestos caution will be used on talcs Fiber #1, Fiber #2, Mouldene, 6M fiber and PL fiber.

1874	Johns Manville	10/23/74 - TEM and SAD of 4 talcs provided by Vanderbilt. Chrysotile, tremolite asbestos and anthophyllite asbestos found.
1974	Johns Manville	11/7/74 - Memo re Vanderbilt complaining to JMM that "JM's decision to insert asbestos caution labels on all talc shippers will result in "irreparable damage" to Vanderbilt."
1975	Vanderbilt	3/27/75 memo Noland to Black. New designations for former International Talc products: IT X, IT 3X, IT 5x, IT FT, IT 325, Mouldene, IT Fiber No 1, IT Fiber No 2, IT Fiber 6N, IT Fiber PL, Ceramitalc HDT, Ceramitalc 10AC, Ceramitalc No 1, Ceramitalc 10-A. Nyltal Nomenclature remains unchanged.
1975	McCrone	Vanderbilt hires McCrone to examine its talc. McCrone reports that the talc contains classic asbestos fibers.
1975	Vanderbilt	MSDS - Health Hazard Data. Asbestiform talc and asbestiform anthophyllite. Have same exposure limit.
1975	Vanderbilt	Vanderbilt tells OSHA that McCrone found that the industrial talc was free of asbestos fibers.
1975	McCrone	McCrone examines 7 new samples of Vanderbilt Industrial Talc. There unequivocally is asbestos in the Vanderbilt talcs examined. The asbestos content in 5% to 20%.
1975	Vanderbilt	Vanderbilt to NIOSH. Vanderbilt wants details of proposed NIOSH visit to "our Gouverneur properties."
1976	Mt. Sinai	Mt. Sinai school of medicine examines 7 samples of Vanderbilt talc. Asbestos fibers found in all 7 samples.
1976	NIOSH	NIOSH Analyzes 7 samples of Vanderbilt Industrial Talcs. "using state of the art analysis all 7 talcs analyzed demonstrated large quantities of asbestiform tremolite and anthophyllite to be present. Based on these analyses, all talcs analyzed should be labeled with the OSHA asbestos warning label.
1976	Vanderbilt	Vanderbilt to NIOSH, accuses NIOSH of leaking information to the press about working conditions at Gouverneur mine and mill. Freedom of information act. Workers are entitled to know.
1977	NBS	National Bureau of Standards examines 7 samples of Vanderbilt Talc. Uses OSHA microscope method, which counts fibers. Both analysts found fibers in all 7 samples the first time they looked.
1978	Vanderbilt	MSDS refers only to non-asbestiform tremolite and anthophyllite. No mention of cancer.
1978	Vanderbilt	1/18/78 - Internal memo, Streitmatter to Erdman. Talc labeling. Talks about starting to put a label on the bags of product. "Caution. Contains industrial talc. Do not breathe dust. Prolonged Inhalation may Cause Lung Injury."

1980	Industrial Hygenics	4/7/80 - Letter from Industrial Hygenics to International Paint Co. The results of these· qualitative and quantitative analyses indicate that approximately 35% of the NYTAL 300 was asbestos fibers (anthophyllite and tremolite) and that approximately 46% of NYTAL 400 was fibrous anthophyllite and tremolite asbestos. Analytically we expect that our quantification of percent could be off by no more than plus or minus 5%.
1980	McCrone	12/9/80 Report by McCrone re: two samples of Nyal. (1) 10 - 15% tremolite-actinolite. 90% of the tremolite-actinolite is fibrous. (2) Tremolite-Actinolite 7 - 10%, 100% of tremolite-actinolite is fibrous.
1980	NIOSH	Talc containing asbestos. Focus on Vanderbilt talc. Long thin fibers of anthophyllite are present. Exposures are over the permissible limits for asbestos. All mines and mills in the area have the same types of fibers. Cancer of the lung and pleura is 4x expected.
1983	McCrone	McCrone again analyzes Vanderbilt talc (3X grade) Reports that that the talc contains 30% to 40% asbestos. An air sample taken when the talc was stirred up contained 70% to 80% of respirable fibers. 11/11/83.
1983	Vanderbilt	Vanderbilt plans to convince customers that 3x talc does not contain asbestos. 12/15/83
1986	Vanderbilt	Kelse of Vanderbilt writes to "Dear John" Gamble who is still at NIOSH, soliciting Gamble's help with OSHA rule making.
1987	NIOSH (Gamble)	Retrospective study of dust exposure and mortality among Gouverneur Talc Company employees. Concludes that there is no elevated risk of lung cancer.
1988	Vanderbilt	Kelse memo re: Parkinson (SUNY Stonybrook) who is working with steelworkers union to submit position paper supporting Vanderbilt position so Steelworkers can take active role against OSHA.
1988	Vanderbilt	Kelse to Parkinson at SUNY Stonybrook with attachment re Vanderbilt position. 6/20/88. "True" asbestos should be tightly regulated. Non-asbestos amphibole should not be regulated, at least not as a carcinogen. Says that non asbestos tremolite talc exposures should be maintained below existing talc standards. No justification for any health standard to cover nonasbestiform amphiboles.
1988	CDC	Sparks 8/11/88 summary report re ethical and legal investigation of NIOSH employees (John Gamble) re Vanderbilt. Appropriate disciplinary action being taken. Recommends review by NIOSH oard of scientific counselors be completed and that the Board provide to you recommendations etc.
1988	Vanderbilt	Kelse to Parkinson at SUNY Stonybrook. 8/30/88. Asks about the Board of Scientific Counselors and expresses optimism about a favorable resolution of "the witch hunt."

1988	CDC	10/23/88 Ross reports Gamble's appeal of suspension and recommends the suspension be imposed.
1988	CDC	Letter to Cowart to Gamble 10/31/88 - references 8/22/88 notice suspending Gamble for 10 days for "conduct unbecoming a Federal employee." Describes Gamble improperly accepting benefits from Vanderbilt and for carrying on work for 2 years outside of normal NIOSH procedures. Further incidents will result in severe disciplinary action.
1989	Vanderbilt	Kelsey to Axelrod NYS Dept Health. Re: non-asbestiform amphiboles. "The importance of this single talc mining population can not be overstated as the entire non-asbestiform amphibole issue pivots on it."
1989	IBSC	Independent Board of Scientific Counselors. Evaluates all NIOSH studies of Vanderbilt workers. A team of industrial hygienists determine that the cancer excess is not due to exposure to cancer causing materials at other jobs. Criticizes Gamble work.
1989	NYS	Vanderbilt complains to the NYS Dept of Health about a presentation made in upstate New York about health hazard for talc workers.
1990	Vanderbilt	5/31/90 internal memo Thompson to Fiederlein. "Neither we, nor our consultants have found asbestos in our ore or products."
1990	NIOSH	Health Hazard Evaluation of R. T. Vanderbilt Company, Gouverneur, NY. Work place exposures at Gouverneur Talc are responsible for excess mortality from cancer and lung disease. Criticizes Gamble work.
1991	Vanderbilt	Kelsey litigation memo to Race 2/8/91. Says that OSHA already intends to exclude non-asbestiform talc. Worried about what co-defendants are going to do re: tremolite. Notes that Southern Talc and California talc contains tremolite. Worried about experts. Craighead, Churg, Mossman. Proposes that Mossman educate Craighead. Shy away from Churg due to his statements re tremolite.
1991	Vanderbilt	Vanderbilt to Gulf Coast Chemicals. No asbestos in our industrial talc. Vanderbilt tells Gulf Coast that there are nonasbestiform fibers in Vanderbilt industrial talc. No mention of cancer danger from asbestiform fibers. Gulf Coast relies on Vanderbilt representations.
1993	Gamble	Publication re: lung cancer, NYS talc workers. Concludes that elevated lung cancer risk is caused by smoking. (At time of publication Gamble is employed by Exxon Biomedical Sciences).
1993	Vanderbilt	Letter to Gamble thanking him for agreeing to "participate as an external reviewer" for what eventually is published as the Honda paper. He will be paid \$3,200 for the job.

1993	Peterson et al	Petersen, E.V., Totten, F., and Guida, M. 1993. Tremolite talc occurrences in the Balmat-Edwards District <i>In</i> Selected Mineral Deposits of Vermont and the Adirondack Mountains, New York. <i>Edited by</i> E.V. Petersen. Social Economic Geology, Guidebook Series Vol. 17, pp. 54-63. Totten and Guida are with GTC. "Fibrous anthophyllite replaces tremolite and coarse-grained anthophyllite, and talc replaces both tremolite and anthophyllite." "Talc shows two distinct habits; one variety is fine-grained, somewhat fibrous in nature and is associated with white tremolite."
2001	Vanderbilt	Vanderbilt letter to National Toxicology Program. Cites outdated Honda study. Fails to cite the additional mesothelioma cases occurring since 1989.
2002	Roggli	Study of mesothelioma. "Asbestos fibers are classified as amosite, crocidolite, tremolite, anthophyllite, actinolite, chrysotile or talc"
2002	Hull Abraham	Reports lung analysis of New York State Talc workers. The only fibers found in the lungs of the industrial talc workers with and without mesothelioma are those found in Vanderbilt talc. No commercial amphiboles found.
2002	Honda et al	Mortality study vanderbilt workers. Paid for by Vanderbilt. Reviewed by Vanderbilt before publication. Relied on information supplied by Vanderbilt. Reports 2 cases of mesothelioma in former Vanderbilt workers. Vanderbilt knows of 5 additional cases before 2002 publication. There is no addendum and no update.
2005	Vanderbilt	Vanderbilt makes presentation to Mine Safety and Health Administration. Vanderbilt fails to disclose the additional mesothelioma cases occurring in Vanderbilt industrial talc workers since 1989.
2007	Vanderbilt	Kelse, 4/2007. Asbestos, health risk and tremolitic talc. Dismisses the reports of meso in Vanderbilt workers: bad diagnosis, inadequate work history, and faulty lung tissue analysis.
2008	Gamble	Gamble & Gibbs paper re lung cancer, meso and cleavage fragments, specific reference to NYS talc. Concludes that meso and lung cancer risk are not increased. References only two meso cases when, by 2009, at least 8 were known. (Unpublished version first appears in 2004 as "A Report to the National Stone, Sand and Gravel Association."
2009	Gamble	Letter to Vanderbilt lawyer Radcliffe re a review of Talc and Mesothelioma to address the question, does exposure to talc cause or contribute to the etiology of mesothelioma?
2012	Finkelstein	Using data available on NIOSH website concludes that mesothelioma rates in NYS talc workers are at least 5x greater than in the general population. NIOSH meso cases include those ignored by Honda and by Gamble.

2013	Finkelstein	Reports on husband and wife who used vanderbilt talc as a parting agent in a small metal casting business. Wife had interstitial fibrosis and calcified pleural plaques. Husband had calcified pleural plaques and mesothelioma. Samples of the talc found fibrous tremolite and fibrous anthophyllite.
2017	Vanderbilt	Admits that there are 10 diagnosed mesotheliomas in a total cohort of 800 Vanderbilt workers.
2017	Abraham et al	Our data support the existence of mesothelioma cases related to exposure to asbestiform talc.