BRUSHWELLMAN
ENGINEERED MATERIALS

Docket H-005C
Ex. 2-1

A CHRONICLE OF RECKLESS REPORTING:

HOW A NEWSPAPER CHOSE FICTION OVER FACTS IN ITS SEARCH FOR THE SENSATIONAL

The truth about Brush Wellman's 50-year effort to solve the mystery of chronic beryllium disease

BRUSH WELLMAN
ENGINEEAED MATERIALS

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Gordon D. Harnett
President, **Chairman**
Chief Executive Officer

Dear Friend of Brush Wellman:

For 78 years, the men and women of Brush Wellman have worked to build a company known throughout the world for the value and quality of its products. Value and quality have made the Brush reputation. Now, in recent months, we have seen our good name and reputation attacked by a reckless series of newspaper articles in the Toledo ***Blade,*** which allege that we have lost our commitment to value, ignored our promise of quality and have simply stopped caring about our people. That just isn't true.

From the moment we were notified of the Toledo ***Blade's*** interest in reporting about Brush Wellman and beryllium, Brush has cooperated with the newspaper. Our employees spent more than fifty hours with the ***Blade's*** reporter – some of them in our own homes – and we provided countless documents to him. We did this in the hope that we could contribute to a balanced journalistic effort which would lay out the story of chronic beryllium disease (CBD) and, at the least, allow the reader of the articles to make his or her own mind up about the history of this disease.

This did not happen. Instead, the reader was presented with only those portions of the CBD story which fit the angle of the reporter. Our story – the true story from those who were there – was replaced by tabloid headlines and biased reporting. The journalistic tactics used in these articles leave the reader in the position of having so little information that he or she could only draw one conclusion – that which the author was promoting.

Where we acted in accordance with the best information available at the time, we are criticized based on knowledge which did not come until later. Where we tried to further knowledge about CBD, we are accused of thought control. Where we practiced our constitutional right of speaking to our government, we are accused of conspiracy. When we warned employees of the risk of CBD, we are accused of misleading them. When we took a Japanese scientist on a series of meetings with governmental agencies to discuss his scientific research, we are accused of hiding the information from those same agencies.

We believe this series of stories was unfair and unethical journalism. Attached is a document which supports Brush Wellman's position that the ***Blade*** article knowingly made inaccurate charges against our company, and that the ***Blade*** was in possession of accurate information, which it chose not to use. I believe you will find it interesting and valuable reading.

I want you to **know** that we are fighting to protect our good name and that we remain totally committed to the safety and health of our employees and to the value and quality **of** our products. I urge you to take the time to read the enclosed material. In it you will see how Brush Wellman has worked for more than five decades to lead the way to higher workplace standards, aimed at protecting the health of all the men and women in this company while fulfilling our vital role in modern society,

When you read the truth about Brush Wellman, I urge you to tell your friends, neighbors, colleagues and elected officials that we are working every day to do the very best job for our people and our communities and we intend to keep improving. I look forward to hearing from you. We need your support.

Thank you,

Gordon D. Harnett

Chronicle of Reckless Reporting

A CHRONICLE OF RECKLESS REPORTING:

HOW A NEWSPAPER CHOSE FICTION OVER FACTS IN ITS SEARCH FOR THE SENSATIONAL

The Truth About Brush Wellman's 50-Year Effort To Solve The Mystery Of Chronic Beryllium Disease

The (Toledo) *BZade* series entitled "Deadly Alliance: How Government and Industry Chose Weapons Over Workers" gravely maligns an industry that for decades has provided, responsibly and in good faith, a product that has been and continues to be vital to modern society, and particularly to national defense.

A chronicle of the events that occurred over a 55-year period – during which the knowledge base about beryllium disease changed dramatically – the series is written in such a way that events are blurred, seemingly as a device for telling a compelling story to readers. It leaves the strong impression that Brush Wellman knowingly allowed a life-threatening situation to drag on for years that could have been curtailed decades earlier.

That impression is a false one.

The fact is that *The Blade* spent **22** months on a six-day series which, at its core, rested on four premises, all of them false. *The Blade* contended that:

- Brush Wellman knowingly overexposed workers to unsafe levels of beryllium, placing company profitability ahead of worker health. The facts show this is not true.
- Brush Wellman and parts of the U.S. government were involved in a "secret deal" to kill an Occupational Safety and Health Administration **(OSHA)** "safety plan" that would protect workers from chronic beryllium disease (CBD). The facts show this is not true.
- Brush Wellman misled workers, regulators and the public about the dangers of beryllium, and withheld the results of a key beryllium study from Japan. The facts show this is not true.
- Perhaps most unfairly, *The Blade* basically ignores or impugns Brush Wellman's 50-year effort and its investment of time and financial resources to better understand all forms of beryllium disease and to eradicate it, once and for all. The facts prove the newspaper's failure to give its readers the truth in this matter.

This document describes some of the Brush Wellman experience dealing with CBD and shows that these and other claims in *The Blade* series are fictions that crumble when the facts are closely examined. It is unfortunate that the newspaper, in its search for the sensational, chose to ignore the facts and needlessly damaged Brush Wellman's reputation, harming many good people along the way. Brush Wellman is compelled to set the record straight.

It is important to note that the facts cited in this document were given to *The Blade's* reporter in more than 50 hours of interviews, some of which were tape recorded; he simply ignored them, apparently because they didn't fit his preconceived story.

Before examining some of these fictions in greater detail and setting the record straight, it is important to look back to the earliest days of the beryllium industry.

An Early Commitment To Knowledge

One of the nation's leading scientists in the area of environmental and occupational exposure to chemicals, Merril Eisenbud, gave testimony before a 1977 public hearing conducted by OSHA. The purpose of the hearings was to consider reducing the beryllium standard of 2 micrograms per cubic meter of air (2ug/m3). In his remarks, Eisenbud described the years 1947-1949:

> *"The State of Pennsylvania presented a problem because the then Director of Industrial Hygiene for the state, Dr. Shilen, took the position with the Public Health Service that there was no such thing as beryllium disease, and had published papers to that effect, some of which I believe were mentioned in the references to the proposed standard. We decided that Ohio would be the best laboratory. They had two production plants there, and the management cooperated magnificently.*
>
> *There have been hints in this proceeding that the management was less than cooperative. I want to contradict that completely. We could not have completed that study except for the fact that the management opened the doors at their plants. They gave us their records; they loaned us staff to help us in the field work, and in every respect were completely cooperative. I think in some respects they were 25 or 30 years ahead of their time. In fact, I might mention that I have in front of me a memorandum which Dr. Sawyer, then Chairman of the Board, sent to all Brush employees in October of 1949, in which he summarized the problem of beryllium disease and advised them what to do about it with respect to consulting their physicians and so on, as needed.*
>
> *It was the kind of memorandum which even today many managements would be reluctant to put out, even in the present far advanced climate, so I think in many respects, as you will see, the beryllium management was way ahead of its time."*

Merril Eisenbud was the man whom the newly created Atomic Energy Commission (AEC) named in 1947 to investigate the health implications of exposure to beryllium. The AEC took the position that since the federal government was the main customer for beryllium, it should ensure its safe production and set exposure standards.

In order for Eisenbud to identify meaningful standards, he had to determine what forms of beryllium caused what forms of disease and at what levels. However, because the AEC had no legal authority to compel industry cooperation in achieving this goal, he had to rely on voluntary participation by industry in collecting his data.

Eisenbud's characterization of Brush's willingness to further the body of knowledge about the health effects of beryllium is just one example of the kind of information that was left out of *The Blade's* series because it didn't fit with the newspaper's point of view.

?he Fiction Of Knowing Overexposure To Unsafe Conditions

One of ***The Blade's*** primary allegations is that Brush knowingly and repeatedly "over-exposed" workers at its plants to "unsafe" levels of beryllium, that the government condoned this and, instead of closing operations down, eased enforcement by relaxing the rules. (Inasmuch as there were no standards prior to 1949, this charge appears to be directed both toward the company's now-closed operation at Luckey, Ohio, which was a government-owned, contractor-operated facility from 1950 to 1957, and subsequent operations.)

The truth is very different. Brush has constantly monitored the air levels in its plants, and made no secret of measurements above 2 micrograms when those occurred; indeed, such test results have been posted for all to see, and disclosed to regulatory agencies. Brush has had procedures in place, triggered by such high air levels, under which the working conditions and equipment in the area are evaluated so that potential causes of high exposure can be found and corrected.

But while Brush knew of measurements above *2* micrograms, it did not know or believe that the measured exposures would cause CBD. Most were still extremely low, and thought to be within the margin of safety provided for by the AEC standard. And Brush's experience for a very long time was that despite measurements above **2** micrograms, employees simply were not coming down with CBD. Indeed, among new hires after 1960, only a few cases of CBD were diagnosed until the mid 1980s – and those few were thought to be explainable by accidental, very high exposures. Brush thought that CBD had essentially been eradicated by the adoption of industrial controls.

The contract with the AEC under which Brush operated Luckey and other plants thereafter covered in detail compliance with the beryllium exposure standards that had been recommended by the agency following Merril Eisenbud's extensive study. The health and safety clause of this contract spelled out how and when Brush would monitor the airborne beryllium in the plant and what actions were required of Brush when air measurements attained various levels, including the mandatory use of respirators at levels above the standard.

Two standards were applied to the conditions inside the plant from the perspective of each single operating process; a third was applied to air quality in the immediate neighborhood of the plant. These levels had been arrived at through standard industrial hygiene methodologies at the time, and were thought to include sizeable margins of safety. The standards were:

- **A** maximum limit of **25** ug/m3 (the **25** microgram standard) to control the acute form of the disease, which appeared to be a direct high dose-response phenomenon.
- **A** standard of **2** ug/m3 (the *2* microgram standard) as exposure averaged over an eight-hour day to control the chronic disease, which appeared to develop over an extended period of time. Determining compliance with this standard for every individual operation involved two steps – first sampling air in the breathing zone of a worker engaged in an operation at a point where the greatest exposure could be anticipated (such as the loading and unloading of a furnace), and then taking air samples generally in the area of the

operation. The time normally spent by the operator in each of these exposure areas was calculated and a relative proportion of time assigned to each one. This would produce a time-weighted average concentration. The standard itself was not an absolute maximum; being a calculated representation of an eight-hour average exposure, it meant that some individual readings could be above 2 micrograms, others below.

- To protect the community in the area surrounding the plant, an air pollution standard of 0.01 ug/m3 (the 1/100 of a microgram standard) as a monthly average concentration for air outside the plant.

The occupational controls dramatically reduced the number of cases of the acute forms of the disease at Luckey almost from the start. ***So*** researchers concluded that the upper limit of 25 micrograms was protective. The AEC contract provided that at no time should any individual air sample at Luckey exceed 100 ug/m3 (100 micrograms, the level thought to cause the acute disease) without the corresponding operation being shut down.

As far as the AEC was concerned, the **2** microgram standard had never been met 100 percent of the time, nor did the agency know if it was even possible to meet it all the time. The health and safety clause in the Luckey contract accordingly permitted temporary readings over **2** micrograms, provided respiratory protection was used and corrective action was taken promptly. Such readings did occur, but were not breaches of the contract, or violations of the applicable standard.

The Blade's slant on this issue is that the **2** microgram standard was a ceiling and that any readings over that level constituted "overexposure"; that is misleading. More importantly, Brush (and the AEC) did not know or believe that all exposures above 2 micrograms were unsafe or would cause disease; the standard was thought to have a large margin of safety, was extraordinarily stringent, and appeared to be effective in preventing disease.

This contract term remained unchanged throughout the operations of the plant, and that same exact language was included in every subsequent AEC beryllium contract, including the Elmore, Ohio, and Hazleton, Pa., plants that were in existence into the early 1960s.

Even with heavy monitoring, self-auditing, and continuously improving controls, Brush found it difficult to meet the **2** microgram target. In compliance with the AEC contract, Brush adapted processes to achieve this standard to the extent that it was possible, and used secondary respiratory protection for processes that were known to be difficult to control.

Moreover, as early as the 1977 **OSHA** hearing, Brush was on record as striving to attain, not just the **2** microgram daily weighted average exposure which was the **OSHA** standard, but zero exposure wherever possible. In the hearing, Brush argued that it knew that a standard of one microgram was not attainable in some operations because if it were, Brush would already be operating at that level. It was the Brush practice to reduce exposures to the lowest level attainable.

Brush's rate of success in meeting the standard has steadily increased over time as technology and equipment have improved. **As** an example, during the 1980s, the average test result for daily weighted averages at Elmore was below 1 microgram. By the late 1980s, **94** percent of test results were below **2** micrograms and in the early 1990s, **96** percent of the results were below **2** micrograms. The company is devoting major resources to reducing exposures even further.

The Fiction Of A "Secret Deal"

In creating an overall impression that a conspiracy was going on between Brush Wellman and parts of the federal government that resulted in **a** "secret deal," ***The Blade*** demonstrates serious ignorance of our country's history. Much of what is recounted in the series occurs over the course of a 30-year time span referred to as the Cold War. The series mentions this, but does little to describe the role of that conflict in decisions made by the government.

The United States was literally fighting with the former Soviet Union for world dominance. And as such, using all available resources, of which beryllium was one, gave our country the competitive edge in the arms race that was part and parcel of the Cold War.

Discussions of how to ensure a continued beryllium supply were certainly classified as they involved critical issues surrounding the manufacture and deployment of the nation's most sophisticated strategic nuclear weapons systems.

The government did take steps in 1979 to ensure a continuing beryllium supply – but not, as ***The Blade*** suggests, at the expense of worker health. The government offered Brush a one-time 35 percent price adjustment to afford Brush the same profitability in the government business as the company was earning at that time in its commercial business, and said that it would not compete directly with Brush – meaning that it would not go forward with a plan for a government-owned, contractor-operated production facility at Rocky Flats. (A monopoly wasn't guaranteed, as at least three domestic and one foreign private sector ventures came into being in the ensuing years.)

In addition, the government would fund a research program to examine the control and regulation of beryllium production processes from an industrial hygiene perspective, and would work with OSHA to demonstrate that OSHA's proposed reduction of the 2 microgram standard to prevent cancer was scientifically unsound – a belief genuinely held by U.S. Department of Energy (DOE) scientists at the time, as reported by ***The Blade*** (in quoting Mr. Jerry Evans), in common with Brush. This scientific issue had nothing to do with CBD – the issue was only whether the standard should be lowered because beryllium exposure might cause lung cancer. Both DOE and Brush were convinced that there was no good evidence for carcinogenicity.

These steps taken by the government were important to Brush's continued viability as a manufacturer of beryllium, and enabled it to assure the government that it would not exit the beryllium business without giving adequate notice. Brush also during this period applied a meaningful portion of its profitability toward capital improvements designed to improve environmental control of beryllium production.

The Blade's allegation that DOE, the Department of Defense and Brush worked to defeat a plan to reduce CBD through a proposed reduction in the 2 microgram standard is unfounded.

In 1975, **OSHA** did propose a new, stricter standard for beryllium exposure, but the proposal had nothing to do with **CBD;** rather it was driven by an attempt on the agency's part to craft what was referred to as a ***"ge***neric cancer policy."

OSHA's rulemaking notice made only a passing reference to CBD. It said that there were two reasons for the continuing occurrence of CBD cases: (1) "new cases continue to be reported involving workers exposed before the **1949** limits were adopted," and **(2)** some cases were being caused by "exposures exceeding permissible limits." The notice did not assert that the **2** microgram standard was inadequate to prevent CBD – indeed, it suggested the opposite.

The purpose of OSHA's cancer policy was to remove any need to debate the carcinogenicity of chemicals on a case-by-case basis. Instead, **OSHA** would have the administrative authority to define carcinogens as any material that induced tumors, benign or malignant, in two or more animal species. The permissible level would be the lowest level attainable, although the concept of attainability would be based not on current capability but on assumed future technological advances.

The issue of cancer was one that Brush had requested the AEC to examine more than ten years earlier – in **1963.** Up to that point, poor quality animal experiments showed beryllium exposure caused tumors, but the industry was hoping for a more sound scientific basis on which to make that determination.

Requests for proposals were issued but never moved forward due to competing priorities at the AEC. In 1965, Brush and the other leading producer at the time, The Beryllium Corporation, jointly made a request for epidemiological studies, this time to the **U.S.** Public Health Service, and they were successful. **(OSHA** did not exist at this time.)

The two studies that were ultimately conducted (with David Bayliss as principal investigator) showed no evidence of human carcinogenicity from beryllium. However, these studies were never published because Bayliss' immediate superior at the Public Health Service disagreed with the outcome. That same superior, Joseph Wagoner, and one of his colleagues, Peter Infante, would go on to work at OSHA during the time of the 1975-1977 standard controversy, and they claimed to have data that contradicted the finding that beryllium was not a human carcinogen.

These data were submitted in the form of two new epidemiological studies which purported to show an excess of lung cancer in beryllium workers. The hearing record clearly revealed so many errors and highly questionable interpretations of the data presented that the Centers for Disease Control (CDC, the parent agency of the National Institute for Occupational Safety and Health, or **NIOSH)** established an internal review panel to attempt to correct the deficiencies in the studies. Infante and Wagoner did not make changes recommended by the panel and finally published the studies without the agency's approval. In disgust, David Bayliss, now listed as a co-author of the papers, wrote a letter to the director of CDC saying, in part:

> ***"As I view it, there is one reason and one reason only why Drs. Wagoner and Infante, over the protests of me and others, including the CDC review panel, refused to use the proper death rates: they wanted to be able to describe the study as demonstrating a statistically significant excess of respiratory cancer in beryllium workers – which is indeed precisely how the study is described in the abstract. The manipulation of input data to permit assertion of a preordained conclusion is not, in my view, evidence of intellectual or scientific honesty. I do not wish to be a part of it, and I do not feel NIOSH should either."***

Subsequently, the beryllium industry, along with eight of the leading beryllium scien-

tists/ researchers of the day, felt it was essential to challenge the unsupportable purported link to cancer that was being used to promulgate a new, more restrictive standard. They appropriately took their concerns to the highest levels of government, which ultimately involved the secretaries of the Departments of Labor, Defense, Energy and Health, Education & Welfare.

The Blade claims that Brush challenged the so-called "safety plan" because the company did not want to spend the money that would be required to upgrade facilities to meet the tighter standard. This is nonsense. Numerous upgrades and other substantial investments related to adding to the body of knowledge about **CBD** have been made since **1977.**

The Cold War undeniably shaped the fate of Brush Wellman and its employees, **as** it did at many other companies that supplied materials needed for government strategic weapons programs. But there was no agreement between the government and Brush Wellman to allow exposures that were known to be unsafe or sufficient to cause CBD.

The Fiction Of Withholding Evidence From Workers And Regulators

The Blade alleges that Brush withheld evidence that 'workers could get CBD even from exposures below the 2 microgram OSHA standard: in particular, a Japanese report of five cases of CBD. The truth is that Brush did not withhold or conceal this report, but actually put its author in contact with OSHA. And the report was in any case based on flawed data.

In 1974, a researcher associated with the Japanese company NGK Insulators, Ltd., Shogo Shima, found what he believed were five instances of **CBD** at exposures below **2** micrograms. **A** delegation of NGK representatives came to the United States to discuss these cases and to learn as much as possible about the state of the art in controlling beryllium exposure.

Before that visit, Brush specifically recommended that NGK meet with interested government agencies – OSHA, NIOSH and the Environmental Protection Agency **(EPA),** – as well as researchers from The Cleveland Clinic, one of the two leading medical institutions working on this issue (the other being Massachusetts General Hospital). NGK did so, and also met with the AEC, researchers from Massachusetts General, and representatives of industry (from Brush, Kawecki Berylco Industries, National Beryllia and Coors Porcelain).

No one with whom NGK met felt that NGK's exposure data were reliable; the American scientists specifically questioned the methodology NGK used and the understanding it had of the actual exposure conditions. First, there was evidence in the NGK data of acute disease, which requires exposures well above the **2** microgram standard. Second, the air sampling protocol used was different from that used in the United States, and was believed to understate exposures, because it only measured beryllium in the general work area, and not in the worker's breathing zone.

Brush made no secret of its disagreement with Dr. Shima. Its Medical Director, for example, published a book chapter that cited Dr. Shima's work and criticized his assumptions.

The Blade criticizes Brush for not entering the NGK experience into the 1977 public hearing record, accusing the company of withholding information from regulators. Yet, why would Brush have made the NGK data part of its testimony? The data had been discounted **as** unsound by all parties, public and private, including **OSHA,** with whom NGK had met and to whom it presented the same information in 1974. Brush withheld nothing from **OSHA;** OSHA had the same information and never saw fit to act on it.

Brush was firmly convinced for decades that exposures below the OSHA standard would not cause disease, and that was the consensus of knowledgeable scientists. During the years that Luckey operated, the **2** microgram standard – at the time, **the** lowest occupational standard ever established – was reviewed annually by an AEC-appointed committee comprised of the leading authorities in this field. At the end of this period, the group, with no empirical data having emerged to show that the level would not protect against CBD, formally accepted the recommended standard.

Over the next several decades, the number of people who worked with beryllium in some form increased tremendously, especially the number of fabricators, but the incidence of disease declined, The consensus of the medical-scientific community through

the 1980s was that the OSHA standard was safe, possibly even too strict, but that its retention provided a margin of safety it was prudent **to** maintain.

To give only **a** few examples:

- In 1972, NIOSH issued its Criteria Document for beryllium, stating that the **2** microgram standard is "effective biologically for the protection of the worker from acute and chronic beryllium disease," and should be retained.
- In 1975, **OSHA** published a pamphlet stating that "the level allowed under the present standard [2 micrograms] is adequate to protect workers".
- In 1983, Merril Eisenbud published an article noting that industrial controls had been "effective in controlling occupational berylliosis," and that there had been a "striking reduction" in cases since adoption of the 2 microgram standard.
- In 1987, EPA published its Health **Assessment** Document for beryllium, stating: "No adverse effects have been noted in industries complying with the 2 ug/m3 standard set by the Occupational Safety and Health Administration; therefore, it appears this level of beryllium in air provides good protection with regard to respiratory effects."
- In 1993, the Agency for Toxic Substances and Disease Registry, Public Health Service, **U.S.** Department of Health and Human Services **(ATSDR)** issued a Toxicological Profile for Beryllium. The Profile stated that "[a]lthough **...** beryllium can cause chronic beryllium disease, workers breathing air containing beryllium less than [2 ug/m3] (a level that government rules permit in a workplace) will probably not develop lung damage as a result of exposure."

Brush, like these experts, believed that the standard was effective. Its Medical Director published articles asserting that exposures at least 15 to 20 times the **2** microgram standard were necessary to cause CBD. The standard was also adopted and remains law in Japan, England, Sweden, Switzerland, Korea, and throughout the industrialized world.

In the 1980s, several significant medical advances took place which have caused a recent reevaluation of the 2 microgram standard. The advent of the fiber optic bronchoscope permitted examination of lung tissue and fluids without an open lung biopsy, and the blood lymphocyte proliferation test (BLPT) was refined and improved to the point that Brush and others felt it could now appropriately be used in surveillance of the workforce to look for beryllium sensitization. (Brush had been a pioneer in developing this latter test; it supported research efforts on the test since the 1970s, and even gave an early version of the test to over 600 employees in 1979 and 1982, with inconsistent and unreliable results.)

These developments resulted in major changes in the approach to diagnosing CBD. The disease could now be diagnosed through a simple blood test and a bronchoscopy; physicians could look for, and find, granulomas in the lungs of workers who were not sick and had no symptoms of disease. A leading article in 1989 accordingly proposed to redefine beryllium disease. Instead of a single disease, it would be three conditions related to beryllium exposure: (1) sensitization, which means that blood or lung cells show an immune response to beryllium; (2) "subclinical" CBD, diagnosed when, in addition to sensitization, there are granulomas in the lungs, which presumably were caused by beryllium, but are not making the worker sick; and (3) clinical CBD, a disease with

symptoms. This last condition was the only kind of CBD that had previously been recognized. This proposed change was widely accepted, and as a result, individuals began to be diagnosed in the 1990s as having "CBD" even though they did not show signs or symptoms of illness, X-ray changes, or any functional evidence of disease.

The result of widespread blood testing by Brush and others, together with the relaxed diagnostic criteria, has naturally been an increased number of cases. With the increased cases have come new questions about whether "CBD" (at least as it has now come to be defined) may be caused by exposures below the **OSHA** standard. For example, Brush hired independent researchers to conduct blood testing and to do an epidemiological study of its Elmore, Ohio, and Tucson, Arizona, workforces. These researchers (Drs. Kreiss et al.) published articles, beginning in 1994, reporting that they did not see clear evidence of exposures above **2** micrograms in all cases. Some scientists now contend that perhaps, for some people, there is virtually no safe level of exposure. Brush and other scientists do not agree, and believe that there is still no scientifically sustainable evidence that the **2** microgram standard is not protective. But the company has acknowledged these questions about the 2 microgram standard; it published in 1995 and distributed to all employees and customers a document called "Statement of Current Knowledge on Chronic Beryllium Disease," which states: "At this time, it is uncertain whether persons exposed only below the standard can become sensitized to beryllium or develop clinical signs or symptoms of CBD."

This is an example of how Brush has given its employees information that is consistent with the state of medical and scientific knowledge at the time. But it by no means is all that is done. Education about working with beryllium begins at the employee's orientation, using a combination of lectures, audio-visual presentations, and a manual with extensive written materials. Existing knowledge is reinforced and new knowledge is shared through monthly safety meetings, bulletin board postings, departmental, meetings, all-employee meetings at least quarterly, and handouts, as well as a letter from Brush's president.

The bottom line is that Brush has been in the forefront of communicating about the health effects of beryllium. It has also sponsored cutting edge research on beryllium disease, and has disclosed the results of that research. ***The Blade*** unfairly tries to condemn Brush with the benefit of hindsight from recent scientific studies that Brush itself sponsored.

The Fiction Of "Thought Control"

The Blade repeatedly insinuates that the involvement of consultants in the effort to understand and eliminate CBD has suspicious intent and that all of these individuals are merely hirelings of the beryllium industry deployed for purposes of "thought control". In fact, as should be clear from their credentials, the Beryllium Industry Scientific Advisory Committee (BISAC) scientists are highly reputable scientists of considerable stature in their fields. They have included Merril Eisenbud, who headed the AEC investigative team that set the three still existing standards for beryllium exposure, was Manager of the AEC's New York Operations Office, Professor of Occupational Health at New York University, and Head of the New York Environmental Protection Program under Mayor John Lindsey; Dr. Paul Kotin, first Director of the National Institute of Environmental Health Services, Assistant Director of the Cancer Institute, and Dean of the School of Medicine at Temple University; Dr. Brian MacMahon, former head of the Harvard School of Public Health, and one of the world's leading authorities on epidemiology; Dr. Adrianne Rogers, who directs the Ph.D. program in pathology at Boston University School of Medicine, in addition to her clinical and research responsibilities as Professor, Associate Chair of Pathology, Boston University School of Medicine; Dr. Dimitrios Trichopoulos, who succeeded Brian MacMahon as head of the Epidemiology Department at the Harvard School of Public Health; and Dr. James Lockey, as Professor of Environmental Health at University of Cincinnati College of Medicine.

BISAC was organized by Merril Eisenbud and Martin Powers in 1990 in response to an industry request for assistance in promoting research about CBD. The original purpose of BISAC was to identify voids in the available knowledge and to suggest the names of competent and willing investigators who could address these voids using seed money provided by industry. If the initial research warranted increased support, BISAC has assisted researchers in obtaining long-term funding from federal research grant agencies. In this way, for example, researchers have obtained funding from the National Institutes of Health and the DOE to study the genetics of CBD, the cellular mechanisms of CBD, and possible animal models for CBD, all in an effort to find ways of preventing or curing the disease.

Pulmonary health monitoring and research efforts undertaken by Brush through BISAC and either independently or in conjunction with NIOSH today form the basis for a responsible and scientifically sound approach to addressing a serious and difficult health problem.

The series further suggests that Brush spearheaded a program of "systematically and aggressively influencing the scientific knowledge of beryllium hazards" and cites as evidence of this (in addition to creating BISAC) the publication of a textbook and sponsorship of seminars at universities.

These measures do in fact form part of Brush Wellman's program to bring a comprehensive and consistent understanding of beryllium to precisely those people who need to understand it. What ***The BZade*** calls "thought control" is really a longstanding practice of sharing important information.

Brush has not only supported the development and dissemination of sound scientific data on CBD, it has been – and today continues to be – in the forefront of such efforts.

In fact, in 1998, at the request of Brush, NIOSH agreed in a signed Memorandum of Understanding to partner with Brush in our continuing health studies.

The Fiction Of Foisting Hazardous Beryllium On An Unsuspecting Public

Another impression left by the series is that the beryllium industry has, with the demise of the Cold War, created frivolous consumer markets for beryllium that are fraught with risk for the general public. Not only is the risk issue highly overblown, but also the premise for contending that this is a recent concern is incorrect.

Even at its peak (1985-89), the defense part of the business was not even a third of the total; it is 5 percent today. Brush's primary business has always been in low-beryllium containing alloys which have chiefly commercial applications. For many decades beryllium alloys have been valued in such applications as mainframe computers, fire extinguisher sprinkler heads and non-sparking tools.

Beryllium is a strategic and critical material for many industries and poses no special risk in solid form, that is, the form in which the public uses it. Articles manufactured from Brush Wellman products save lives. For example, they are used as critical, high-reliability elements in air bag sensors, fire extinguisher sprinkler heads, X-ray windows for mammography, medical laser bores, pacemakers, landing-gear bearings and **GOES** satellites for severe weather forecasting.

Brush Wellman products also form critical components in many of the advanced systems on which society depends, including both wired and wireless communications. Copper beryllium is used extensively in auto electronics, including the ignition control systems of many modern automobiles to increase gas mileage, thereby reducing air pollution. Other applications include computers, oil exploration equipment, and plastic injection molding dies,

Beryllium products still fill critical military needs as well. Most of the advanced electro-optical targeting and infrared countermeasure systems contain beryllium components, improving their performance and protecting our military personnel. Beryllium components are also found in advanced missile systems and the radar systems that control them. Many of the advanced surveillance satellites also contain beryllium structures and electronic components.

Brush Wellman's comprehensive program of product stewardship ensures that beryllium customers – who are mainly secondary fabricators of beryllium materials – have the kind of information and resources they need to be as educated as possible on the occupational health and safety issues associated with beryllium.

The Brush Wellman product stewardship program includes:

- Product labels (in use since 1949 – fully **36** years before they were required);
- The most current Material Safety Data Sheet **(MSDS)** with the first order of the year;
- Update letters on health, safety and medical surveillance;
- Access to the Beryllium Consultant Network;
- Customer safe handling videos;
- On-site customer employee hazard communication training;
- On-site customer workplace industrial hygiene assessments;
- **A** highly trained sales and marketing force;

- A 24-hour health and safety information service;
- Internet access to the MSDS; and
- Outreach at American Industrial Hygiene Association conferences.

In addition, Brush has made a significant commitment to assuring that scrap beryllium is reused instead of discarded. In the past three years alone, Brush has purchased more than 16 million pounds of beryllium-containing scrap material for recycle back into production processes. In 1986, the company was recognizing the importance of this commitment when it invested roughly $12 million in a dedicated copper and beryllium resource recovery facility, designed to recycle processing wastes that would otherwise be disposed of in a landfill.

Since the late 1970s, more than $60 million has been invested in process improvements and environmental controls engineered specifically to reduce ambient beryllium levels in the plants. Also included in this figure are the costs of sponsoring the Beryllium Industry Scientific Advisory Committee and the research it initiates as well as the extensive medical surveillance program the company conducts at its production facilities. This year Brush made additional process and industrial hygiene improvements at its Elmore plant designed to further reduce beryllium exposures for workers, customers, contractors, vendors and the community.

The Fiction Of Brush As A Negligent Environmental Citizen

Brush's performance apart from the issue of occupational exposure to beryllium is also a subject of ***The Blade*** series. The company is characterized as being a habitual violator of environmental laws and a threat to the surrounding community as a result. This is just patently untrue.

The plant is not creating "serious public health problems" for the community as a result of groundwater contamination or air pollution. The Ohio Environmental Protection Agency **(OEPA)** itself has reported that the Portage River estuary, which begins on Brush property, is "one of the four best performing Lake Erie estuaries because of low municipal/industrial impacts." There are no reported or known cases of CBD relative to Elmore neighbors from air pollution since production began at Elmore in 1953.

The reality is that Brush, like most industrial companies, operates under a complex web of environmental regulations that require constant and comprehensive oversight by both the company and the regulators. As a large manufacturing facility, Brush's Elmore operations fall under the jurisdiction of the OEPA's Northwest District office in Bowling Green. Brush Wellman cooperates with this agency to continuously improve its environmental performance. Whenever there is an exceedance or spill, as happens in industry despite all best efforts to prevent them, they are responded to, reported to the appropriate authorities and corrected as quickly as possible.

The majority of violations on record were reported by the company to the OEPA pursuant to the extensive self-monitoring and self-reporting requirements under which Brush operates. The Elmore plant performs comprehensive air, wastewater and groundwater monitoring on a routine basis and has continuously improved its controls and practices to ensure the safest possible operation.

The Fiction Of Exploiting Employees To Win Volunteerism Awards

The characterization of the program at Elmore to place employees who had CBD but were capable of working in jobs in the community as "slave labor" and a ploy to win a volunteerism award is an outright insult to the many employees who so generously give of their time and resources in their own communities.

The outplacement program was actually only one of numerous initiatives Brush described in preparing the nomination for the Heart of Volunteerism Award. The company has a comprehensive program of fostering community service among its employees, including Brush retirees. That year, at least 80 percent of our employees performed volunteer work, contributing an estimated 100,000 hours of time to dozens of community organizations over the course of the year. While the company takes no direct credit for this, we are justifiably proud of the contributions our employees make to the community and accepted the award in their behalf.

Among the beneficiaries were the United Way, the American Red Cross, and the Air National Guard. Brush's initiatives have ranged from helping to create an annual fundraiser for the local heart association, the Chick Schaffner American Heart Classic, to developing a leadership giving program for the United Way that has become a model for Ottawa County, to converting 150+ acres of farmland to wildlife habitat. All totaled, a conservative estimate of the value of cash goods and human resources Brush and Brush employees contributed to the community in 1996 was $360,000. This was the basis for the Heart of Volunteerism nomination. Nothing *The BZade* says can diminish the value of our employees' contributions to the community.

The company's objective in creating the outplacement program was to provide employees with meaningful work in a beryllium-free environment for those who needed that. Employees participated in selecting the work setting and our feedback is that the program was appreciated, both by the employees and the organizations where service was provided.

In Summary

These are only some of the glaring errors in ***The Blade*** series, which chose sensationalism over professionalism. This reckless reporting, if left unchallenged, could harm not only Brush Wellman but also our employees and our communities.

Brush Wellman is committed and determined to prevent chronic beryllium disease. The health of its employees and a safe workplace always have been, are, and will remain of paramount concern.

CHRONOLOGY OF EVENTS

ADVANCING KNOWLEDGE ABOUT AND PREVENTING CHRONIC BERYLLIUM DISEASE

The (Toledo) *Blade* series entitled "Deadly Alliance: How Government and Industry Chose Weapons Over Workers" covers more than 55 years of history. The series biasedly presented and misrepresented "facts" to create the illusion of misconduct when none exists. For example, the article is structured in such a way that only selected events are mentioned, and it judges past events by today's standards of scientific and medical knowledge.

The following chronology is designed to shed a more complete light on the developments relating to beryllium over the 55-year period. Although a comprehensive chronology was not possible to prepare in such a short time, this document, together with the summary entitled "A Chronicle of Reckless Reporting: How **A** Newspaper Chose Fiction Over Facts in **Its** Search for the Sensational," demonstrate unequivocally – decade by decade – that Brush has been in the forefront of every major effort to identify and eliminate the hazards of beryllium exposure since those hazards were first researched in the United States.

The 1940s

In the 1940s, the relationship between beryllium and health effects **is first** *hypothesized and developed. Because no one* ***knows*** *what the relationship is at this point, airborne concentrations of beryllium during much of this decade range from 100 to 10,000 times higher than the levels typically experienced* ***in*** *modem times.*

1943..... Medical debate begins in the United States about a lung problem arising in facilities using beryllium materials. The first occupational beryllium disease case in acute form is identified in the United States by Dr. Howard *S*. Van Ordstrand of The Cleveland Clinic.'

The **U.S.** Public Health Service (PHS), however, disagrees with Van Ordstrand and publishes an article stating beryllium **is** inert and not toxic?

As a result of this controversy, the two principal beryllium producers have different views on the course of action to take in the years that follow. The Beryllium Corporation in Pennsylvania, Brush's competitor, embraces the PHS view and consequently takes no action to protect workers or warn customers for some time. This decision is supported by medical and industrial hygiene authorities in that state. Brush, however, subscribes to Dr. **Van** Ordstrand's view, and begins cooperating with researchers to determine causes of the problem. Brush's cooperation ultimately leads to the establishment of control standards to reduce exposures.[3]

1945.....Dr. Van Ordstrand, together with Dr. Joseph DeNardi (who treated workers at Brush's Lorain facility), and Dr. M. G. Carmody (who treated workers at a Painesville beryllium company), reports cases of the acute disease, including five fatal cases.[4]

1946.....Dr. Harriet Hardy (Massachusetts General Hospital) and Dr. Irving Tabershaw (Massachusetts Public Health Service) report cases of workers in the Massachusetts fluorescent light industry whose symptoms are not acute but are similar to the symptoms **of** a rare disease known as Boeck's sarcoid. They hypothesize that exposure to phosphors of beryllium is somehow involved.[5]

1947.....**A** tuberculosis laboratory symposium under the direction of Dr. **A.** Vorwald first publicly addresses the Hardy/Tabershaw findings concerning what later becomes known as chronic beryllium disease (CBD).[6]

The Atomic Energy Commission (AEC) is created, and following the symposium, assigns Merril Eisenbud as the lead scientist to investigate beryllium's health implications. The ***AEC*** takes the position that since the federal government is the main customer for beryllium, it should ensure its safe production and set exposure standards, although nothing in the law requires the AEC to do this.

1948.....Eisenbud visits Charles Sawyer, President of Brush, to discuss cases of beryllium disease in the neighborhood surrounding Brush's Lorain, Ohio, plant. Sawyer "understood immediately that it was necessary to determine how many cases existed in the community and asked how this could be done."[7] "On the initiative of Brush" this situation is discussed with the Commissioner of Health for the State of Ohio, and Brush cooperates in a large-scale community X-ray program conducted by the State of Ohio in Lorain.[8] Approximately 6,000 residents are X-rayed and 11 cases of lung disease in persons not employed by Brush are identified.

The Lorain plant is destroyed by fire.

1949.....Following a two-year AEC investigation, three exposure standards are recommended by Eisenbud:

1. From .the air emission data, Eisenbud theorizes that the so-called "neighborhood" cases stem from plant-caused air pollution. An air pollution standard is proposed of 0.01 microgram per cubic meter **of** air (the 0.01 microgram standard) as a monthly average. Later investigations of the "neighborhood" cases show that some or all have contact with the plant directly or with workers or their clothing brought home from the plant.

2. As a result of data collected during an accident, Eisenbud recommends an exposure limit of 25 micrograms per cubic meter of air (the 25 microgram standard) to prevent the acute disease, a limit with a four-fold safety factor. The occupational controls immediately reduce the number of cases of the acute form of the disease in the then-existing beryllium industries.

3. Based on a comparison with other metals, a workplace exposure limit of 2 micrograms per cubic meter of air (the 2 microgram standard) of air as a daily weighted average over an eight-hour day is recommended to prevent what will become known as CBD, a limit thought to have a substantial safety factor.

Brush signs a contract with the AEC to operate a government-owned plant in Luckey, Ohio. The facility is to be used to produce beryllium for the government in accordance with government specifications and requirements. The plant does not begin operation immediately because controls are to be installed to reduce beryllium exposures to the levels required by the AEC.

Brush develops product warning labels and submits them to others, including Dr. Vorwald, for review. Thereafter, Brush begins placing warning labels on its beryllium products for commercial uses. The AEC has its own labeling requirements.

Brush sends a letter to all of its customers explaining the health hazards associated with beryllium and attaches a copy of an article entitled "Berylliosis: Acute Pneumonitis and Pulmonary Granulomatosis of Beryllium Workers."[9] A warning label is attached to the article as well.

Brush develops a "President's letter" to employees about the health hazards associated with beryllium which it submits to the AEC for review. It notes that beryllium "may be a poisonous substance, capable of injuring at least some persons in various ways," and points out that ''information concerning this element is as yet very incomplete, although every effort is being made to develop new facts which will reveal the true hazard presented by its production .and use."[10] After AEC review and approval," Brush sends the letter to all employees. A version of the "President's letter" is reissued with each new Brush president after 1949.

The 1950s

The 2 microgram workplace standard is reviewed annually by an AEC-appointed medical and scientific committee composed of leading beryllium authorities. After several years of review, the AEC adopts the original levels on a continuing basis.[12]

On the medical front, the Beryllium Case Registry (BCR) establishes the criteria for determining whether an individual has CBD and new theories begin to develop regarding whether the chronic form of the disease has an immunological component or results from the traditional dose-response relationship. It will be decades (until the 1980s) before the medical-scientific community reaches consensus about this.

1950.....The Luckey facility begins operation pursuant to the contract with the government.

Brush's "Air Sampling Program" for use at its Luckey, Ohio, plant[13] includes eight-hour average exposure limits (for "special locations") and 72-hour average exposure limits (for other locations), with exposures measured using general area air sampling and breathing zone air sampling. Measurement of any sample exceeding 2 micrograms triggers "an immediate investigation" and use of "corrective measures to bring the sample below the target level." If sample results exceeding 2 micrograms persist for 15 days, the operation is shut down immediately "pending the installation of corrective procedures." A daily weighted average concentration exceeding 5 micrograms also triggers immediate shutdown.

1951.....Eisenbud advances the theory that "berylliosis" might have an immunological component since the incidence of disease among similarly exposed persons varies considerably.[14] Dr. Harriet Hardy disagrees with the immunologic model and continues to promote the dose-response model.[15]

AEC begins to fund a registry to record cases of disease thought to be caused by beryllium exposure so that the health effects and their causes can be studied.

1952.....The existing beryllium disease registry is transferred to Massachusetts General Hospital under the direction of Dr. Harriet Hardy and becomes known as the Beryllium Case Registry. The BCR is moved to the National Institute for Occupational Safety and Health (NIOSH) in the late 1970s.

1953.....Brush begins building a foundry at Elmore, Ohio, to use excess beryllium feedstocks from the Luckey facility in the production of beryllium copper for the commercial market. This will enable the company to compete directly with The Beryllium Corporation in Pennsylvania.

1956..... The federal government announces its intention to turn its beryllium business over to the private sector and close the Luckey plant.

The American Industrial Hygienists Association **(AIHA)** publishes a "Hygiene Guide" recommending the 2 microgram standard.[16]

1957.....Beryllium operations at Luckey end and the Elmore facility expands to produce beryllium for the government's needs as well as commercial markets. Brush's expansion is built to meet the recommended standards. Monitoring has been continuous at Elmore ever since, including periods when the AEC contractual standards cease to be applicable and before the Occupational Safety and Health Administration **(OSHA)** and U.S. Environmental Protection Agency **(EPA)** standards take effect, in 1970 and 1974, respectively.

The Beryllium Corporation builds a plant similar to Elmore in Hazleton, Pa. This plant is to compete with Brush for beryllium supplied to the government.

The American Conference of Governmental Industrial Hygienists (ACGIH) formally adopts the 2 microgram standard.

1958.....Brush continues its cooperation in studies relating to beryllium by participating in a study conducted by J. Cholak of the Kettering Laboratory. Results of the study are published in 1959 by the **U.S.** Department of Commerce.

Breslin & Harris of the AEC publish an article reflecting 10 years experience in controlling beryllium in the workplace.

The 1960s

During the 1960s, the consensus of the medical-scientific community is that the beryllium standard is too stringent but that its retention provides some "unknown, but obviously adequate" margin of safety.[18]

On the medical side, debate continues on the cause of the chronic form of the disease: immunological based versus dose-response based.

Brush and Kawecki Berylco Inc. (KBI, formerly The Beryllium Corp.) work together to develop a broad-reaching program of distributing information and warnings about the hazards of beryllium. This cooperation to provide warning information continues in the following decades.

1961.....First documented case of CBD at Elmore.

Dr. Lloyd Tepper (a BCR physician), together with Dr. Harriet Hardy and Richard Chamberlin (an industrial hygienist working with the **BCR** and other beryllium programs), publishes a monograph entitled "Toxicology of Beryllium Compounds."[19] It is "an attempt to assemble in one volume what is currently known of the toxicology **of** beryllium and its compounds." It states that "the level of **2** micrograms is generally held to be conservative, probably overly conservative."

A workshop on beryllium is held at the Kettering Laboratory. The purpose of the workshop is to bring together a wide variety of professionals involved in beryllium. **A** series of presentations is made at the workshop. One presenter noted that "[t]he use **of** a standard of **2.0** mg per cubic meter has been shown to be relatively safe **and** is probably conservative."[20] Another presenter suggests increasing the threshold limit value (TLV) to **5** micrograms."

1962.....The Kettering Laboratory issues "Toxicity of Beryllium – Final Engineering Report." That report concludes:

"Data collected in recent years during extensive investigations of the air in plants engaged in the processing of beryllium and some of its alloys, support the observations of Machle, in 1948, that the above target values have been exceeded manyfold, continuously and probably for several years without apparently producing the chronic disease. The uncertainties concerning the precise quantitative relationships between the severity and duration of the exposure and the occurrence

of the chronic disease in the past, raise questions as to the need for 'a limit as low as the one recommended."

1963.....Brush suggests to the ***AEC*** that it fund an epidemiological study of beryllium workers on the question of carcinogenicity since the agency has an active public health function due to the many non-weapons applications of nuclear energy. Requests for proposals are issued but competing priorities of the AEC put this on hold. Up to this point, poor quality experiments on animals show beryllium exposure causes tumors.

Brush replaces product warning labels with new warning labels.

1965.....Brush and The Beryllium Corporation together approach the **U.S.** PHS with same request as made in 1963. Two unpublished studies **by** the service's David Bayliss ultimately follow, showing no unusual occurrence of lung cancer in beryllium workers.

1966.....An AEC-AMA monograph edited by Dr. H. Stokinger suggests that the **2** microgram standard is too stringent.[22] Commenting on the **1961** Kettering Workshop, it states: "There was unanimous agreement that, coincident with the strict application of the beryllium limits, all forms of berylliosis disappeared. Thus, there can be no question of the effectiveness of the limits; rather, it is a question of whether they are unnecessarily low, and if so, by what magnitude. **...** The best argument for leaving the limits as they were proposed is that they are effective."

1967.....David Bayliss, with the U.S. **PHS** (predecessor to **NIOSH),** begins an epidemiological study concerning beryllium workers and cancer.

The PHS holds a symposium on beryllium attended by leading medical and industrial hygiene experts working with beryllium. **A** published report **of** that conference states that both the **2** microgram standard and the 0.01 microgram standard might be too stringent but recommends no change without a basis for doing so.[23] A majority of participants reject the position that air pollution alone caused non-occupational cases of CBD, believing these cases to be contact-based. In its conclusion, the document states: "Reevaluation of the threshold limit values is certainly indicated. There is considerable expression of the idea that beryllium, in the forms present now in industry, is less toxic than had been considered on the basis of present standards."

The 1970s

The early 1970s begin to see the development of a potentially useful test to determine diagnosis of CBD – the blood lymphocyte transformation test (LTT). Brush supports efforts to develop the test, and even has an early version of the test administered to over 600 of its workers, but the test is not as successful as hoped.

Beginning in the mid-1970s, debate centers on whether beryllium is a carcinogen. Bayliss presents results of an epidemiological study showing no evidence of human carcinogenicity at an AIHA meeting, but the study is never published due to internal squabbling at the U.S. PHS. The data is then changed by others which leads to debate of whether the human cancer studies were scientifically sound.

1970.....OSHA is created.

The American National Standards Institute (ANSI) publishes its recommendations on "Acceptable Concentrations of Beryllium and Beryllium Compounds."[24] The ANSI standard, which is purportedly based on "all authoritative published data" and the experience of ANSI committee members, specifically adopts the AEC's 2 microgram exposure limit.

1972..... NIOSH issues its "Criterion Document for Beryllium."[25] That document recommends that OSHA retain the 2 microgram standard after reviews of all available research. "The standard recommended in this document is similar to that adopted by the AEC in 1949 and the present OSHA environmental standard. It is felt to be feasible technologically for the control of worker exposure to beryllium and effective biologically for protection of the workers from acute and chronic beryllium disease." With respect to the "neighborhood cases," NIOSH states: "In nearly every instance of a reported neighborhood case, close examination of the circumstances indicates exposure to be caused, or contributed to, by means other than ambient air pollution. ... It has yet to be definitely established whether ambient air contamination alone, at a distance from a plant, can cause chronic beryllium disease."

OSHA adopts the recommended standard and an associated sampling protocol recommended by ANSI.

Brush's Code of Safe Work Practices, in use beginning in about 1972, states that "regular air sampling surveys are conducted in all control areas and results are published and distributed to each department."[26] It also states: "Air sampling data is posted in each department. You may request additional air sampling if such data is not available." The Code also explains that "as an added precaution and since accidental exposures cannot always be prevented, periodic examinations are required to detect the occurrence of [CBD] and institute its proper treatment as early as possible."

1973.....EPA adopts the former AEC air pollution standard for beryllium of 0.01 microgram~.~'

Doctors at The Cleveland Clinic publish an article regarding efforts to develop a blood test to detect sensitivity to beryllium.[28] The authors acknowledge the "collaboration" of Dr. Otto Preuss, Medical Director of Brush.

1974.....OSHA first inspects Elmore. It finds that several processes exceed the **2** microgram standard and gives Brush three years to correct them.

Japanese producer NGK Insulators, and its medical consultant, Dr. Shogo Shima, ask Brush for an opportunity to meet with them during a visit to the United States to discuss empirical data suggesting that CBD can occur even when exposures are below the **2** microgram safety limit. Brush responds to the letter request by inviting the Japanese to visit Brush and also recommends that they meet and discuss their findings with OSHA, NIOSH, EPA, the National Research Council, and doctors at the The Cleveland Clinic.[29]

- NGK meets with four government agencies **(OSHA,** NIOSH, EPA, AEC), the two leading medical institutions involved in investigating medical issues (Massachusetts General Hospital and The Cleveland Clinic), and representatives from industry (Brush, KBI, National Beryllia and Coors Porcelain).

- No one with whom NGK meets believes that NGK's data are reliable. American scientists specifically question the methodology NGK used and the understanding it had **of** the actual exposure conditions. NGK returns to Japan to reevaluate its conclusions.

1974-1975.....Brush replaces its product warning labels with new product warning labels.

1975.....**OSHA** issues a generic cancer policy, declaring any material that produces tumors in animals ***to*** be a human carcinogen and requiring exposure limits to be lowered to the lowest attainable limit. **A** proposed beryllium standard is issued as part of the agency's effort to establish a generic cancer policy.[30]

A 1975 OSHA pamphlet entitled "Beryllium" (part of the Job Health Hazards Series) states that "the level allowed under the present standard **is** adequate to protect workers from excessive beryllium exposure."[31]

1976.....Brush and numerous other entities and individuals submit written comments opposing the lower beryllium standards proposed under the proposed generic cancer policy.

1977.....**OSHA** holds hearings on the proposed beryllium standard. Dr. Van Ordstrand, who states that he is present only on behalf of The Cleveland Clinic, and is not being sponsored **by** any other organization (such as Brush), testifies:

"I have probably had the opportunity to examine and diagnose more cases of chronic beryllium disease than any other physician in the world. In my experience, I am not aware of any chronic case where the airborne beryllium concentration to which the individual **was** exposed **was** not in excess of the present standard. Accordingly, in my opinion, based on this clinical experience, adherence to the recent standard for daily weighted average concentration satisfactorily prevents the

occurrence of the chronic disease, and there is no reason relating to the chronic disease which justifies the proposed reduction of that standard."

Merril Eisenbud likewise testifies:

"The present **TLVs** for beryllium, which have been in existence for nearly **30** years, have been successful in controlling both the acute and chronic form of beryllium disease. **...** In my opinion, the TLVs need not be changed because the records provide no reason for doing so."

Others, including Richard Chamberlin, the industrial hygienist for the BCR, also testify that the 2 microgram standard, when followed, protects workers.

1978..... The **U.S.** Department of Energy **(DOE)** creates a beryllium task force to study the impact of **OSHA's** plan to tighten the standard on the domestic beryllium supply. The group concludes it will have a negative impact on the two main beryllium producers, which in turn will have serious national security implications. The task force also registers concern over the validity of the science upon which the standard reduction is based following concerns expressed in writing by eight prominent scientists in the field of occupational health and cancer epidemiology.[32]

Eula Bingham, **OSHA** Assistant Secretary, writes to Dr. Julius Richmond, Assistant Secretary for the Department of Health, Education and Welfare **(HEW)**, requesting that he bring together a group of senior governmental scientists for review of the epidemiological clinical and experimental data included in the beryllium record and to provide OSHA with an assessment that will assist its resolution of the issues raised in regard to the data. She informs Dr. Richmond that **OSHA** will hold in abeyance issuance of a final standard until **OSHA** has received his comments.

The Beryllium Review Panel reviews the cancer studies on which **OSHA** premised its proposed rule, and recommends changes to the manuscript. **A** still later review notes that "There are limitations to this body of evidence. In some cases, adequate controls were not used. In others, results were not published in peer reviewed journals."[33]

Joseph Califano, Secretary of HEW, writes to Ray Marshall, Secretary of Labor, transmitting the report of the Beryllium Review Panel and stating that **"OSHA** [should] proceed to set standards that limit exposure to beryllium in the work place." **A** copy of the letter is sent to James Schlesinger, Secretary of Energy.[34]

Brush sends a letter to its customers to remind them of the hazards relating to beryllium. The letter says "all employees handling beryllium-containing materials, and all supervising personnel, should be informed of the hazards involved" and offers to provide additional warning labels.

1979.....Cabot Corporation quits the beryllium business. Brush becomes the sole **U.S.** supplier of beryllium for defense purposes. The government pays Brush an increased price comparable to commercial rates for beryllium. DOE also undertakes to discuss with **OSHA** the lack of a scientific basis for the proposed carcinogenic standard.

At Brush's urging and as part of an effort to develop a reproducible blood test for detecting beryllium sensitivity, 571 Elmore employees and 88 Delta employees participate in blood LTT testing. The main objectives of the testing are "to confirm the test's specificity, to search for early sensitization among our workers and to evaluate the test's suitability as a surveillance tool."[35]

The 1980s

As the number of people who work with beryllium in some form increases, especially the number of fabricators, the incidence of disease declines. The consensus of the medical-scientific community continues to be that the OSHA standard is safe, possibly even too strict, but that its retention provides a margin of safety it is prudent to maintain.

Several significant medical advances occur which lead to a re-evaluation of the 2 microgram standard in subsequent years. The advent of fiber optic bronchoscopy permits the examination of lung tissue and fluids without an open lung biopsy, and the development of blood tests more specific for beryllium sensitization will make medical surveillance of the workplace possible.

1980.....The **U.S.** Supreme Court affirms a **U.S.** Court of Appeals ruling that rejects the standard established by OSHA for benzene exposure.[36] The benzene standard, like the proposed beryllium standard, is one of the standards issued as part of the agency's effort to establish a generic cancer policy. OSHA subsequently withdraws its generic carcinogenic standards, including the standard for beryllium, and begins a review process.

David Bayliss writes a letter to the Centers for Disease Control repudiating the NIOSH cancer study (of which he was listed as the co-author with J. Wagoner and P. Infante) as a biased "manipulation of input data to permit assertion of a preordained conclusion."[37]

1981.....Brush opens its Tucson, Ariz., ceramic production facility.

NIOSH issues a report after investigating three cases of CBD arising from the Autonetics plant (a facility producing products for the government).[38] Among other findings, NIOSH concludes that beryllium exposures at Autonetics were in excess of the 2 microgram standard and that exposures may have been underestimated because Autonetics used general air samples, not breathing samples, to measure exposure of workers.

1982.....Follow-up blood testing of Delta employees is conducted. The authors of a report on the testing conclude that beryllium sensitization may reverse itself if exposures are reduced and notes that Brush has made "special efforts" to do so.[39]

DOE provides $3.5 million to Brush to investigate more readily controllable alternate processes for producing beryllium. The study reveals no overall process that is superior to the ones then being used, and also shows that the most critical production processes are actually becoming more compliant even as production is increasing dramatically. The study results in numerous recommendations to improve environmental control of the existing processes, which are implemented beginning in 1985, with favorable results.

1983.....Eisenbud notes that, in spite of a substantial increase in production of beryllium and workers employed in the beryllium industry, there has been a "striking reduction" in CBD cases since the 1950s,[40] and that "there is substantial evidence that the methods of control adopted in the early 1950s have been effective in controlling occupational berylliosis."

H.G. Piper, Brush Chairman and Chief Executive Officer, restates Brush's commitment to supply the government with beryllium "without reservation of any kind." The commitment is "not contingent upon any future action by the Government or any other organization and is categorically firm."[41]

1984.....A new CBD case at Rocky Flats generates a renewed scrutiny of both industrial hygiene practices and medical evaluation of individuals in the workforce.

DOE issues a report on exposures at Rocky Flats noting exposures in excess of 2 micrograms. NIOSH also issues a report on exposures at Rocky Flats noting high exposures.[42]

1985.....As part of the new OSHA Hazard Communications regulations, Brush sends a letter to customers reminding them of the health hazards associated with beryllium, together with warning labels and Material Safety Data Sheets.

1985-1988.....The DOE-funded process study leads to Brush investing more than $20 million in process improvements and environmental controls engineered to reduce ambient beryllium levels in the plants. Brush also invests $12 million in a dedicated copper and beryllium resource recovery facility designed to recycle processing wastes that would otherwise be disposed of in a landfill.

1986.....Brush provides an educational grant for a CBD diagnostic workshop held at The Cleveland Clinic.

First case of CBD is confirmed at Brush's Tucson facility.

1987.....EPA publishes the final version of the Health Assessment Document for beryllium.[43] In the "Summary and Conclusions" part of the document, EPA states "No

adverse effects have been noted in industries complying with the 2 microgram standard set by the Occupational Safety and Health Administration; therefore, it appears this level of beryllium in air provides good protection with regard to respiratory effects."

1988.....In a proposed rulemaking, OSHA examines exposure standards for hazardous chemicals including beryllium.[44] **OSHA's** rulemaking does not propose a change in the beryllium standard, but rather continues the **2** microgram standard.[45]

1989.....An article in the ***Journal of Occupational Medicine*** proposes that the diagnostic criteria for CBD **be** changed so that the diagnosis of CBD will be based only on demonstrable sensitivity to beryllium and biopsy findings. Under this proposed criteria, it will no longer be necessary to have clinical symptoms and signs of disease, the standard for diagnosing CBD set by the BCR.[46]

The National Materials Advisory Board of the National Research Council does its own study of Brush's production processes, essentially confirming the findings of the **1982** DOE-funded study?'

The 1990s

New medical developments, especially the Blood Lymphocyte Proliferation Test (BLPT), have led to new definitions of CBD, including conditions where workers do not show signs or symptoms or illness, X-ray changes or any functional evidence of disease. Widespread blood testing by Brush and others, together with these relaxed diagnostic criteria, lead to an increased number of CBD cases in the 1990s. With the increased cases come new questions about whether CBD, as it has come to be defined, may be caused by exposures below the OSHA standard.

1990.....The Beryllium Industry Scientific Advisory Committee **(BISAC)** is established and begins coordinating and standardizing a program of immunological testing for all beryllium industry workers,

1992.....Brush begins blood testing of employees at Tucson using a newer technique, that being the **BLPT.** Brush initiates parallel, independent epidemiological studies through Dr. Kathleen Kreiss at the National Jewish Medical and Research Center.

1993.....The Agency for Toxic Substances and Disease Registry, Public Health Service, **U.S.** Department of Health and Human Services issues a Toxicological Profile for Beryllium.[48] The Profile states that "[a]lthough the soluble and insoluble forms of beryllium can cause chronic beryllium disease, workers breathing air containing beryllium at less than 0.002 milligrams in a cubic meter [the **2** microgram standard] (a level that government rules permit in a workplace) will probably not develop lung damage as a result of exposure."

OSHA adopts the **2** microgram standard for the shipbuilding industry?'

1993-1994.....Brush begins BLPT of employees at Elmore. Dr. Kreiss uses the testing data in her parallel epidemiological studies. An additional $4 million is invested in environmentally friendly fluoride processing equipment.

1995.....Brush issues a "Statement of Current Knowledge on Chronic Beryllium Disease."[50] The statement describes the "major changes" in the approach to diagnosing CBD brought about in the 1980s by the general introduction of the fiber optic bronchoscope for examination of the lungs and the development of blood tests more specific for beryllium sensitization. "The first change was the recognition that persons could develop granulomatous inflammation in their lungs without any symptoms or other signs of illness, .,. Second, the diagnostic criteria of CBD have changed to one that requires only evidence of this lung inflammation and lung sensitization to beryllium." The Statement explains that, since these developments, cases of CBD are being diagnosed that before the 1980s probably went unrecognized. The Statement also acknowledges new uncertainty regarding whether exposures only below the standard can cause CBD. "At this time, it is uncertain whether persons exposed only below the standard can become sensitized to beryllium or develop clinical signs or symptoms of CBD."

1996.....The Chemical Substance TLV Committee of the ACGIH reviews the **2** microgram workplace standard and recommends that it be retained, "in view of the success of the AEC exposure limit."[51]

Dr. Kreiss' study of Tucson workers, supported by Brush, is published; it states that machinists have a higher sensitization rate than other employees **(14.3** percent vs. **1.2** percent), and that machining has significantly higher exposures, even though they are "largely within those permitted by current regulations." The authors cannot determine whether exposures above the **2** microgram standard account for the higher risks to machinists.[52]

Dr. Kreiss is invited to give a presentation to Brush's Elmore workers concerning her epidemiology study, and tells them, among other things, that certain areas of the plant appear to pose higher risks, and that the **2** microgram standard may not protect them from **CBD.**

1997..... Dr. Kreiss' study of Elmore workers is published. It finds that 9.4 percent of tested workers either have CBD or are sensitized to the disease, based on an abnormal blood test.[53] The authors thank Brush's "administrative officers for their vision in requesting this surveillance study; the plant and corporate medical personnel for coordinating the interview schedules, blood drawings, clinical referrals, and transfer of clinical and laboratory data; the plant **and** corporate industrial hygienists for historical and environmental data;" and the members of BISAC.

A program of BLPT of employees at Delta, Utah, plant begins.

Dr. Shima et al. publish an article confirming that the Japanese use a general air sampling method instead of the breathing zone method used in the United States, and therefore underestimate exposures when compared with United States.[54]

1997-Present. Restricted area zones and other environmental controls continue to be implemented at Brush plants, an investment of more than $12 million.

1998..... Brush initiates a partnership, in conjunction with Dr. Kreiss, who is now at NIOSH, to step up health studies and combine resources, with the objective of understanding the varying potencies of beryllium in different forms.

A second round of BLPT begins at Tucson.

1999..... In response to medical surveillance and epidemiological studies, Brush modifies workplace practices at Tucson and Elmore, including strict zoning to prevent cross-contamination within the plant, mandatory respirator use in production areas, and housekeeping measures to reduce skin exposure and exposure resulting from clothing contamination.

Brush begins a second round of BLPT at Elmore and announces a program for testing at its Reading, Pa., facility.

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READER'S NOTE:

Most of the contents of ***The Blade*** six-part series, "Deadly Alliance: How Government and Industry Chose Weapons Over Workers," is reprinted within the following document to facilitate a comprehensive response by Brush Wellman to the fictions that form the basis of the series. Within the six parts, we excluded a number of articles for the following reasons:

Part 1, Article 2: Many workers at government sites feel betrayed – This article deals exclusively with **U.S.** government facilities, not those of Brush Wellman, so the company has no knowledge of or comment on its contents.

Part 1. Article **3:** Dust to dust: Coal town hit hard by black lung now struggles with beryllium disease – This article deals exclusively with facilities of another company, about which Brush Wellman has no knowledge or comment.

Part 1, Article **4:** Atomic bomb scientists among early victims – This article deals with activities outside of Brush Wellman, about which the company **has** no knowledge or comment.

Part 2, Article 2: Twist of fate: Industry defender switched sides when diagnosed with cancer – This article deals with the circumstances of an executive from a company other than Brush Wellman, and again, require no comment.

Part **3,** Article **4:** Wife of beryllium worker contracts illness – This article concerns a family member of a retired Brush Wellman employee. **As** a matter of policy, Brush Wellman does not discuss medical matters relating to individual employees or their families for the sake of their privacy.

Part 5: Stint as secretary exposed Marilyn Miller to what would eventually kill her, and Part **6,** Article **4:** Fight for life measured one step at a time – Both of these articles are about now-deceased former Brush Wellman employees. No one regrets the terrible results of **CBD** more than those responsible for the health of Brush Wellman employees on the job. Brush is dedicated to finding a solution to this problem and preventing the disease in the future. In the meantime, we are doing our best to deal with difficult situations like these and to provide whatever comfort is possible.

PART 1

WEAPONS BEFORE WORKERS

Part 1: Weapons over workers

Decades of risk: U.S. knowingly allowed Workers to be overexposed to toxic dust

BY SAM ROE
BLADE SENIOR WRITER

Over the last five decades, the **U.S.** government has risked the lives of thousands of workers by knowingly allowing them to be exposed to unsafe levels of beryllium, a material critical to the production of nuclear weapons.

The Blade **contradicts this statement on page 7, where it states, "Federal officials have not been oblivious to the illness. Millions of dollars have been spent to improve safeguards and identify victims."**

As a result, dozens of workers have contracted beryllium disease, an incurable, often-fatal lung illness.

This **is** a *sometimes*-fatal illness.

In the Toledo area alone, at least **39** workers have contracted the disease after being exposed to levels of beryllium over the federal safety limit. Six of these workers have died.

A 22-month investigation by The Blade shows that the **U.S.** government clearly knew, decade after decade, that workers in the private beryllium industry were being overexposed to the hard, lightweight metal, which produces a toxic dust when manufactured or machined.

This is misleading. See **A** Chronicle of Reckless Reporting, "The Fiction of Knowing Overexposure to Unsafe Conditions."

But federal officials continued to subsidize and encourage the industry to produce beryllium despite numerous government, scientific, and company reports showing that the material could not be made without putting workers in extreme danger.

Government contracts to supply beryllium were not subsidies. **As** stated in **A** Chronicle of Reckless Reporting, it is misleading to suggest that federal officials ignored the risk associated with the production of beryllium, which **was** absolutely essential to national defense and the successful conclusion of the Cold War.

Some workers were exposed to levels of beryllium dust 100 times above the safety limit, the government's own contemporaneous records show.

When safety regulators tried to protect workers, they ran up against an overwhelming alliance: the beryllium industry and the defense establishment.

The reference here is to an attempt on **OSHA's** part to label beryllium a human carcinogen as part of the agency's effort to establish a generic cancer policy for the first time, and was not aimed at preventing CBD. See A Chronicle of Reckless Reporting, "The Fiction of a Secret Deal."

Protection of the industry has reached all the way to the White House cabinet, where in the 1970s President Carter's Defense and Energy secretaries helped kill a safety plan.

Characterizing the actions of various government employees as "protection of industry" is misleading and at odds with their objections to the **OSHA** proposal.

They feared the plan would cut off beryllium supplies for weapons, and that would "significantly and adversely affect our national defense," **U.S.** Energy Secretary James Schlesinger wrote to two cabinet members at the time.

The Blade investigation, based on tens of thousands of court, industry, and recently declassified government documents, reveals **a** decades-long pattern of the government putting beryllium production and costs ahead of worker safety.

An objective review of the record shows otherwise. See "Chronology of Events – Advancing Knowledge About and Preventing Chronic Beryllium Disease."

"The [government] cannot stand for a cessation of production," one federal official, Martin Powers, told colleagues in 1960 in response to health concerns. **Dr.** Peter Infante, director of standards review for the **U.S.** Occupational Safety and Health Administration, says the government has done a poor job protecting beryllium workers.

"These are all deaths and disease that could have been prevented," Dr. Infante says. "That's the sad thing about it."

To this day, there is no complete understanding of how to eradicate CBD.

Victims question why the government risked their lives for weapons.

"We're killing ourselves trying to kill someone else," says Gary Renwand, a 61-year-old who contracted the disease at the country's largest beryllium plant, outside Elmore, O., **20** miles southeast of Toledo.

Among the local workers who have died:

Gary Anderson, a former Elmore high school football star.

Marilyn Miller, the wife of a dairy farmer in Bradner.

Ethel Jones, a Fremont, ***O.,*** resident whose son, Eric Johnson, also contracted the disease.

Others have had their lungs so ravaged that they can no longer breathe on their own.

"If they had told me I'd end **up** hooked up to an oxygen tank my whole life I would have run away from the damn place," says Butch Lemke, who was overexposed at the Elmore plant and has been on oxygen for 15 years.

No one knows how many people have ever contracted the disease. Researchers estimate 1,200 documented cases nationwide and hundreds of deaths. But they say the disease often is misdiagnosed or goes undetected.

This is pure conjecture, using unidentified sources and no authority. There is no evidence that CBD is ***often*** misdiagnosed.

And it is difficult to determine how many victims have had exposures above the safety limit.

This much is clear: Beryllium disease has emerged as the No. 1 illness directly caused by America's Cold **War** buildup.

"I know of no other disease that we can document that is solely attributable to the work that we have conducted in the production of nuclear weapons," says Dr. Paul Seligman, director of the Energy Department's Office of Health Studies.

Among The Blade's findings:

Decade after decade, the government has knowingly allowed workers at privately operated beryllium plants in Ohio and Pennsylvania to be exposed to amounts of beryllium dust far above the **U.S.** safety limit. The plant outside Elmore, owned by Cleveland-based Brush Wellman Inc., has never consistently complied with the safety limit in all parts of the facility.

This repeats the misleading information corrected in **A** Chronicle of Reckless Reporting, "The Fiction of Knowing Overexposure to Unsafe Conditions."

Production and costs have been put ahead of safety even when workers were in danger. In one case, federal officials said it was policy that saving money would come before safety when choosing some beryllium suppliers.

This statement refers to the fact that 50 years ago, the beryllium competitors were not in agreement about whether beryllium was a disease agent and whether plants should function as though it were. **Brush took the position that it was a disease and acted accordingly.**

Safety enforcement by OSHA has been virtually nonexistent. Even though dozens of workers have contracted beryllium disease at the Elmore plant, several of whom have died, **OSHA** has conducted only one full inspection of the facility in the past **20** years.

Not true. OSHA conducted comprehensive inspections in 1993 and 1997, along with numerous spot or "partial" inspections over the course of the past *20* years. In 1999 a comprehensive inspection was again conducted.

Even though beryllium is a highly toxic material, the government has little idea which companies are using it, how many people are exposed, and whether they are being protected. This means thousands of Americans may be exposed to dangerous amounts of beryllium and not even know it.

This statement has absolutely no basis in fact; it is simply a reporter's mistaken conclusion. Brush's comprehensive program of product stewardship ensures that beryllium customers – who are mainly secondary fabricators of beryllium materials – have the information and resources they need to be as educated as possible on the occupational health and safety issues associated with beryllium. This includes, for example, product labels, which Brush has used since 1949 – fully ***36*** years before they were required. It also includes the most current Material Safety Data Sheet with the first order of the year (also available on the Internet); update letters on changes in medical and scientific knowledge concerning beryllium; customer safe handling videos; a highly trained sales and marketing force; and on-site customer employee hazard communication training as well as workplace industrial hygiene assessments. Brush also helps maintain a Beryllium Consultant Network comprised of professional industrial hygienists who have either attended an industrial hygiene training seminar on beryllium or have experience controlling occupational exposure to beryllium. These consultants provide services independent of Brush, but the company assists the network with refresher courses and written materials updating the body of knowledge about beryllium.

Despite mounting illnesses and deaths, the government has not tightened exposure limits in 50 years. It has tried only once, and the Carter administration stepped in and helped kill the plan.

For most of those ***50*** years, the prevailing belief was that the exposure limits in existence were adequate to prevent CBD. **The one time the government tried to change the standard, it was a process driven by a OSHA's desire to establish a cancer policy, not address CBD.** See **A** Chronicle of Reckless Reporting, "The Fiction of Withholding Evidence from Workers and Regulators."

Long a strategic metal, beryllium is lighter than aluminum and six times stiffer than steel. It makes nuclear weapons more powerful, missiles fly farther, and jet fighters more maneuverable.

And it has been critical to the space program, having been used in the early Mercury missions, the space shuttle, and the Mars Pathfinder.

But when the metal is ground, sanded, or cut, and the resulting dust inhaled, workers often develop a disease that slowly eats away at their lungs. About a third with the illness eventually die of it.

Scientists still consider the illness mysterious - even bizarre. Tiny, invisible amounts of beryllium dust can be deadly; the federal exposure limit - 2 micrograms per cubic meter of air - is equivalent to the amount of dust the size of a pencil tip spread throughout a 6-foot-high box the size of a football field.

And while some people are unaffected by the dust, others get sick at seemingly insignificant exposures. ***So*** researchers think some people are genetically susceptible to the illness. Those individuals often develop the disease years after their last exposure to beryllium - up to 40 years later.

Beryllium is also used to save lives in MRI units, mammography, auto air bags, fire extinguishers, pacemakers and satellites for severe weather prediction, among many other uses.

To **us,** one ill worker is one too many, but most workers do not develop CBD; hence, it is not true that workers "often" develop this disease. Further, this prognosis of fatality for CBD patients was based upon early experience. It is no longer meaningful, in light of modem diagnostic techniques and treatments. The frequency of fatality depends entirely on the time frame in question and when the diagnoses were made.

It wasn't until the late **1980s** that the means to clinically assess allergic reaction to CBD became available. The advent of the Blood Lymphocyte Proliferation Test and fiber optic bronchoscopy has dramatically altered the way in which industry and government are now combating the continuing existence of the disease. **When these medical advances became available, Brush immediately took the lead to use them.** Furthermore, as far back as the 1970s, Brush supported efforts to develop the precursor test to the BLPT, and

even had an early version of the test administered, in 1979, to some 600 of our workers in order to confirm the test's specificity, to search for early sensitization among workers and to evaluate the test's suitability as a medical surveillance tool.

Federal officials have not been oblivious to the illness. Millions of dollars have been spent to improve safeguards and identify victims.

Brush hasn't been oblivious to the illness either, since its first appearance in 1943. We've made understanding and preventing **CBD** a priority for more than 50 years, spending in excess of **$60 million** over the past two decades alone to fund groundbreaking research and improve manufacturing safeguards and processes.

And it is unknown whether every single beryllium worker has been overexposed; the available exposure data are too sketchy.

Although millions of air samples have been taken over the years, it has not been possible to monitor every employee every minute.

Nor is it known precisely what constitutes a safe exposure. Exposures over the federal limit do not seem to guarantee illness, and exposures under the limit may not guarantee safety. In fact, more and more scientists think that people can get sick at levels under the limit.

***The Blade* admits that what would be a safe level is not known but proceeds to accuse government and industry of knowingly "overexposing" employees.**

What remains clear is that over the years, beryllium plants with close governmental ties have consistently exceeded the federally mandated safety limit with the government's full knowledge, and workers in those facilities have gone on to develop the disease.

Brush has always acted based on the best scientific knowledge available at the time and taken innumerable steps to promote worker safety and maintain safe levels of exposure to beryllium. See "Chronology of Events – Advancing Knowledge About and Preventing Chronic Beryllium Disease."

Martin Powers, a former **U.S.** Atomic Energy Commission official in charge of obtaining beryllium for the government in the 1950s, says federal officials knew about the high exposures and tried to control them.

But he says the government did not want to shut the plants because that would mean stopping weapons production.

"What is the greater risk? To possibly expose people to health injury in the plant or shut down the national defense?"

The existence of strategic defense issues did not preclude the fact that, from **1943** through the present, there has been **an** affirmative effort on the part of industry and government to understand and control **CBD.**

Mr. Powers, who left the government to become a beryllium industry executive, says workers, at times, were put at increased risk for national security reasons.

"You know you are putting them at increased risk. You hope the risk doesn't materialize, doesn't become a reality."

The Energy Department, which is responsible for maintaining the nuclear weapons arsenal, says there are no substitutes for beryllium. ***So*** **as** long as America wants bombs, workers will face dangers.

"Building weapons is an extraordinarily risky process," the Energy Department's Dr. Seligman says.

Some victims say they knew there was a risk, but they didn't know they were being overexposed.

Brush Wellman, America's largest beryllium producer, says it has always posted air test results on plant bulletin boards and has discussed high exposures with employees.

Posting air counts is just one aspect of Brush's comprehensive occupational safety and health program, reflecting the company's determination to do all that it can to eliminate CBD. See **A** Chronicle of Reckless Reporting, "The Fiction of Withholding Evidence from Workers and Regulators," for further information.

But it acknowledges that by the time high dust counts are discovered, workers have already been overexposed.

This statement is misleading. The entire ***Blade*** series ignores the use of respirators. Although air counts may show beryllium levels above **2** ug/m3, this does not mean the employee was or is overexposed. See **A** Chronicle of Reckless Reporting, "The Fiction of Knowing Overexposure to Unsafe Conditions."

MAGICAL METAL TURNS DEADLY

Discovered in France in 1798, beryllium wasn't produced commercially in America until the 1930s. When it was, it was extracted from beryl and bertrandite ores and processed through a series of chemical steps.

Among the first uses of beryllium: fluorescent lights. Workers coated the insides with beryllium-containing phosphors to help make the glass tubes glow.

At the time, beryllium dust was considered harmless. **No** one wore respirators, and no one appeared to be getting **sick.**

Then came World **War** II.

Suddenly, the U.S. government needed tons of beryllium for the top secret Manhattan Project, the $2 billion effort to build the world's first atomic bomb.

Beryllium plants signed government contracts and began shipping orders to Manhattan Project sites. To maintain the secrecy of the project, shipments were in unmarked packages, identified only by code names, such as Product **38.**

"The word 'beryllium' should never be used," one government document warned.

In 1943, federal officials ran into a problem that threatened supplies: Beryllium workers, many in the Cleveland area, began developing a mysterious illness.

They were coughing, losing weight, and becoming breathless. Many recovered, but some grew sicker and died.

A Cleveland Clinic doctor concluded in 1943 that beryllium dust was toxic. But the **U.S.** Public Health Service, in a report that same year, thought some other agent was to blame.

The doctor was Howard S. Van Ordstrand, a leading pulmonary physician for many years and a pioneer in the discovery and treatment of **CBD.**

As the controversy brewed, the government stepped up its beryllium orders. When the factories couldn't keep up, the government spent millions to expand them.

By the mid-1940s, dozens of people had become sick, both at Manhattan Project sites and in the fluorescent light industry.

And the mysterious disease was exhibiting a new twist. Researchers studying the fluorescent light industry concluded in **1946** that workers were getting sick months - even years - after their last exposure to beryllium. No one was recovering from this form **of** the illness, which would become known as chronic beryllium disease.

By now, most scientists and industry leaders agreed that beryllium dust was toxic.

The government recommended safety improvements and supplied respirators for some workers. But it was also deeply concerned about its image.

A 1947 secret report by the newly formed Atomic Energy Commission, or AEC, warned that the disease "might be headlined, particularly in non-friendly papers, for weeks and months - each new case bringing an opportunity for a rehash of the story. This might seriously embarrass the AEC and reduce public confidence in the organization."

Despite mounting sickness, the AEC remained "acutely interested in maintaining and expanding production of beryllium," according to the report, which was recently declassified.

The agency's mission - building nuclear weapons - depended on it.

"The AEC appears to be stuck with beryllium," the report said, "and hence stuck with the public relations problem."

Here, *The BZade* suggests that the problem of CBD was viewed by Brush as a "public relations" problem. **Let it be very clear that Brush Wellman has always considered this a serious health problem to be dealt with seriously.**

DISEASE STRIKES LORAIN RESIDENTS

Just weeks after the government outlined its public relations fears in 1947, a tragedy began to unfold: People living near a beryllium plant in Lorain, O., started coming down with the disease.

One 28-year-old woman dropped to 85 pounds. Another became so weak she had to remain in bed.

Government officials were stunned. Never before had people been known to contract metal poisoning by living near a factory.

Fear in Lorain spread quickly. Citizens stormed a city council meeting, and Councilman Leo Svete had to pound the gavel for 15 minutes to restore order.

The AEC took air samples around the plant, and the Ohio Health Department announced it would conduct a rare and massive project: It would X-ray as many Lorain residents as possible.

In fact, the Ohio Department of Health took on this project as a result of a proposal from Merril Eisenbud and Brush's CEO, Dr. C. Baldwin Sawyer. This was at a time when the **U.S.** Public Health Service and medical authorities in Pennsylvania (where the other major beryllium manufacturer was) contended that beryllium **was** non-toxic, and Brush could easily have followed suit. **As** Eisenbud testified before **OSHA** in 1977, **"Fortunately, Dr. Sawyer recognized that epidemiological information was badly needed so that the dilemma could be resolved. All clues must be followed – wherever they might lead."**

X-ray stations were set up at schools, JC Penney, and Abraham Motor Sales. In all, 10,500 people were X-rayed - a fifth of the entire city.

And when the inquiry was over, 11 citizens who had never set foot in the plant were found to have the disease.

The wife of one worker got it by handling her husbands dusty work clothes. But the other victims, the ***AEC*** found, got it strictly from beryllium air pollution.

Among them: 7-year-old Gloria Gorka, a chubby girl with curly hair.

"We noticed she kept panting and had a hard time breathing when she exerted herself in the least little way," recalls her father, Joseph, an 81-year-old now living in Florida. **"We** just thought she **was** having a hard time getting over the measles."

When her schoolteacher called and said Gloria was having difficulty walking up one flight of stairs at school, her parents took her to a doctor. But there was nothing anyone could do.

"It was so sad," recalls her 79-year-old aunt, Angela Barraco. "By the time she died she was nothing but skin and bones."

AEC officials concluded that the victims had been exposed to surprisingly minute levels of beryllium. They recommended that citizens should no longer be exposed to more than .01 micrograms per cubic meter of air - an amount invisible to the naked eye.

The limit was the first air pollution standard in American history.

As for the limit inside beryllium plants, officials weren't sure what to do. They discussed the matter for weeks, and then an ***AEC*** health official and **a** medical consultant to the fluorescent light industry settled on **2** micrograms while riding in a taxi.

This limit, based largely on guesswork, was dubbed "the taxicab standard."

Officials knew workers might become ill at lower levels, a 1958 AEC report states, but "because of the relatively small numbers of people involved," it was seen as "an acceptable risk."

This is not even a remotely accurate characterization of how the standard was selected. See A Chronicle of Reckless Reporting, "The Fiction of Knowing Overexposure to Unsafe Conditions."

This characterization suggests this limit was capricious when in fact it was arrived at by the leading experts in the field using scientific principles of the day, and making the best available analogies to other toxic metals. They made a reasoned determination and built in a sizeable margin of safety besides.

COSTS MADE A PRIORITY OVER WORKER SAFETY

Publicly, the government was cracking down.

While the ***AEC*** was setting limits on pollution, the **U.S.** Public Health Service was convincing fluorescent light companies to stop using beryllium.

Government officials issued warnings about the lights already in use: Children shouldn't use them as lances, and burned-out tubes should be broken under water.

But unbeknownst to the public, the government was embracing beryllium, ordering more for weapons.

In fact, in 1949 the ***AEC*** adopted a policy that weapons production and economics would come before worker safety when the United States was choosing some beryllium suppliers.

One top official who was upset about this, records show, was Wilbur Kelley, manager of the AEC's New York office.

In the summer of 1949, he and his staff were concerned that the government was planning to buy beryllium hydroxide - the vital feed material for all beryllium products - from a plant outside Reading, Pa., operated by the Beryllium Corporation.

Mr. Kelley had reason to be concerned: Dust in the plant was hazardously high, and several workers had died.

In a series of letters, **Mr.** Kelley pleaded with his AEC colleagues not to buy beryllium from the firm.

This is misleading. The ***AEC*** devoted substantial resources to protecting beryllium workers through its contracts and otherwise, particularly after the 1949 adoption by the agency of three beryllium exposure standards.

"The AEC cannot avoid knowing that every time it enters into a contract for the production of beryllium in what it knows to be a medically unsafe plant the lives of an unknown number of people may be placed in jeopardy," he wrote.

The government, he wrote, "cannot shirk its moral responsibility in this matter."

But at a meeting of top AEC officials in Washington, Mr. Kelley was informed that, except in certain contracts, the government would no longer bear "the responsibility for health conditions associated with the procurement and production of beryllium materials," minutes of the meeting state.

It was decided that "further consideration of medical reasons would be dropped and that all consideration of the proposed arrangement with the Beryllium Corporation would be based strictly on economics."

It is unclear whether the AEC went ahead and bought beryllium from the Beryllium Corporation. But the government continued its association with the firm.

The AEC owned a small building on plant grounds that cast beryllium metal. The Beryllium Corporation ran the casting operation under a government contract.

For the next **20** months, from the summer of 1949 to the spring of 1951, workers in that building were exposed to dust up to 100 times the safety limit, records show.

Conditions in Beryllium Corporation's main plant were worse: Some workers were exposed to dust 500 times the limit.

And many people went on to get beryllium disease.

In fact, in the 10 years following Mr. Kelley's repeated warnings about the Beryllium Corporation, at least 37 people either working at the plant site or living nearby developed the illness, studies show.

Among them: a woman who paid weekly visits to a relative's grave in the cemetery across the street from the plant.

PLANTS KEPT OPEN DESPITE DANGERS

The 1950s brought the Korean War and the arms race, the Cold War and the space race. America's desire for beryllium had never been greater.

The government didn't want a repeat of the Lorain neighborhood tragedy, and so it paid Brush Beryllium, the predecessor to Brush Wellrnan, to build and operate a plant far from residents.

Brush was awarded an AEC contract to produce beryllium, as its Lorain facility had burned down and no resources then existed to rebuild (and it was in a residential area). The only other producer at that time, the Beryllium Corp., did not recognize beryllium as a health hazard and operated without controls. The government did regard that fact as a liability and awarded the contract to Brush.

The site: tiny Luckey, a farming community 15 miles south of Toledo. Here, only one or two farmhouses would be near.

And for the first time, the government had a safety standard - the one adopted in 1949 - to limit the amount of dust workers could be exposed to.

But year after year, records show, dust counts in the Luckey plant were high. Workers were even overexposed in the lunchroom.

Instead of closing the plant, the government eased enforcement of the rules, allowing workers to be exposed to levels five times higher than previously permitted.

Not true. See **A** Chronicle of Reckless Reporting, "The Fiction of Knowing Overexposure to Unsafe Conditions."

But even with the relaxed rules, the plant couldn't keep the dust under control.

See above.

Eight years later, in 1957, the plant was replaced by a larger one 10 miles away near Elmore.

Under government contract, Brush Beryllium built, owned, and operated the plant. In return, the government agreed to buy 50 tons of beryllium over five years. The AEC signed a similar contract with the Beryllium Corporation for a plant outside Hazleton, Pa.

Both contracts had a health clause: If dust levels were consistently high, the government could close the plants.

See **A** Chronicle of Reckless Reporting, "The Fiction of Knowing Overexposure to Unsafe Conditions."

Again, workers were overexposed throughout the 1950s and 1960s, industry and government records show. Dust counts at Elmore were regularly five times too high; some levels at Hazleton were 4,000 times over the limit.

Yet the Elmore plant was never shut, and the Hazleton plant was closed only once for about a month, according to a deposition by Mr. Powers, the former government and industry official.

The Elmore plant was indeed shut down twice by Brush Wellman itself, while process corrections were made for exceeding the ambient air standards.

The beryllium companies tried to meet the safety limit but to no avail. **A** Brush doctor blamed the failure on production demands, "triggeredprimarily by the space program."

One Brush document says every time the government considered closing the Elmore plant, "the Navy and AEC weapons people objected because they needed the metal for nuclear weapons and Polaris [missile] parts."

AEC officials, correspondence shows, weren't sure what to do about the high exposures.

One official wrote that better equipment had been suggested, but "this would increase the cost of beryllium by ten times," and "the plants would have to be shut down and rebuilt."

"The extra cost would be undesirable, but the latter factor **is** unacceptable because of AEC need for the metal."

Still, as bad **as** the dust counts were, they were improving and the disease rate appeared to be dropping. In fact, some officials thought the exposure rules might be too strict.

The source is unidentified and we're not sure of the time frame being referenced. However, the National Materials Advisory Board in 1989 examined the beryllium production process at our plants and concluded that the best processes available were being utilized. This essentially confirmed a 1982 DOE study which revealed no overall process existed that was superior to the ones then being used, and also showed that critical production processes were actually becoming more compliant even **as** production was increasing dramatically. The company's program of continued improvement has involved upgrading plant air controls as technology advanced. Over the past two decades, Brush has spent **in** excess of **$60 million** to fund groundbreaking research and improve manufacturing safeguards and processes.

There was always controversy about how stringent the exposure standards needed to be, but **Brush never pushed to relax the standards and worked to reduce exposures to the lowest level reasonably achievable.** See "Chronology of Events: Advancing Knowledge About and Preventing Chronic Beryllium Disease."

In 1960, a dozen AEC officials met to discuss the issue. They concluded that the plants, dangerous or not, must remain open, minutes of the meeting show.

"The [government] cannot stand for a cessation of production," one official stated.

That official was Martin Powers, in charge of buying beryllium for the AEC. But he was also responsible for ensuring that the beryllium plants were not overexposing workers.

Four months after this meeting, Mr. Powers left the government to work for one of the firms he had been responsible for monitoring: Brush Beryllium.

He would spend the next 26 years as a top executive with the company, often handling the government contracts and' overseeing the health and safety program.

In his first year, he was specifically prohibited from interacting with the government, as is the case when people leave government to work for agencies to which they'd awarded contracts previously.

Today, Mr. Powers, **77,** is retired from Brush but remains **a** paid company consultant. The government, he says, didn't know for sure that workers were going to be harmed by the overexposures. But **he** acknowledges the ***AEC*** was taking a risk that they might.

"I think there were certainly cases where you might have allowed marginal activities to exist hoping - but not really knowing - that they were going to be all right."

He says pressure on the **AEC** to keep plants running was enormous. He recalls receiving a phone call from an admiral who was livid about AEC plans to phase out a plant.

"This admiral called me and said, 'You will' not shut that goddamn plant down. What are you, out of your goddamn-picking mind? I've got submarines out there. We need missiles.' "

This quote is out of context. The discussion concerned closing the Luckey plant in order to transfer equipment from there to facilitate the start-up of the new Elmore plant. It was only cited to ***The Blade*** as an example of the Cold War pressures we were all working under.

Mr. Powers says he didn't agree with some government decisions. He says that the AEC for one or two years, about **1949** and **1950,** insisted that Brush not put warning labels on beryllium products shipped to AEC facilities because it didn't want to alarm workers there.

Officials who made that decision, he says, "just didn't apparently feel it was their province to worry about the health issues."

Numerous workers would eventually develop beryllium disease after being overexposed in the **1950s** and **1960s.**

Among them: Gary Renwand, an *Oak* Harbor, ***O.,*** resident who worked **35** years at Brush's Elmore plant.

Out of respect for the privacy of our employees, Brush Wellman does not comment on the medical records of individuals.

Company records show that he was frequently exposed to high levels of dust - some amounts five times the safety limit.

Now, he is often in and out of St. Charles Mercy Hospital, battling heart and lung problems related to his disease. On one such day, he sits up in bed and recalls making beryllium re-entry shields for space capsules and watching the capsules on TV careen back to Earth.

"I thought, 'Hey, we made that shield.' And I was proud. I was **part** of this. **A** new era."

He forces a laugh.

"Young and dumb," he says.

SAFETY PLAN FOUGHT; SECRET BARGAIN CUT

Only once in the last five decades has the **U.S.** government tried to tighten exposure limits.

That was in 1975, when OSHA proposed cutting the exposure limit in half - from **2** micrograms per cubic meter of air to 1.

The plan met tremendous opposition from the beryllium industry and **U.S.** weapons officials. Energy Secretary James Schlesinger warned that the plan might drive beryllium firms out of the metal business and cut off **U.S.** supplies.

"The loss of beryllium production capability would seriously impact our ability to develop and produce weapons for the nuclear stockpile and, consequently, adversely affect our national security," he wrote in 1978 to Labor Secretary Ray Marshall and Health, Education, and Welfare Secretary Joseph Califano, Jr.

Secretary Schlesinger wanted the scientific basis for the plan reviewed. Defense Secretary Harold Brown made a similar request.

So the plan was delayed until outside experts could review it. In the end, the experts concluded that the science behind the safety plan was indeed valid.

The industry opposed the plan with cause. See A Chronicle of Reckless Reporting, "The Fiction of a Secret Deal."

The senior author of the study that formed the "scientific basis" for the plan repudiated it in a 20-page letter (see A Chronicle of Reckless Reporting, "The Fiction of a Secret Deal") and NIOSH itself took issue with the study and wouldn't publish it, and ultimately redid the studies under new authors.

But the plan never went through.

One factor: In 1979, the Cabot Corp., now the owner of the beryllium plant outside Hazleton, Pa., quit making beryllium metal, leaving Brush Wellman as the sole U.S. supplier.

Almost immediately, the government cut a secret deal with Brush, according to government and industry records. Brush promised to continue to supply the Energy Department with beryllium for its weapons; in return, the agency promised to:

This characterization is disingenuous. Some of the discussions were classified because they involved critical issues surrounding the manufacture and deployment of our most sophisticated strategic nuclear weapons systems. This is standard procedure for military matters.

- Pay Brush a one-time 35 per cent price increase.

The price adjustment would afford Brush the same profitability from the government business as the company was earning at that time in its commercial business.

- Not develop other sources of beryllium.

The implication here is that Brush would be guaranteed a monopoly, which is not the case. The government agreed not to compete directly with Brush by funding a production facility being contemplated at Rocky Flats that would have been a government-owned, contractor-operated facility like Brush's Luckey facility. However, at least three domestic and one foreign private ventures have been formed in the ensuing years (only to go out of business due to lack of markets).

- Try to persuade OSHA to drop its safety plan.

Recognizing that the beryllium industry needed some resolution on the question of control and regulation of production processes, DOE agreed to fund a research program to examine these issues from an industrial hygiene perspective. It also pledged to work with OSHA to demonstrate that OSHA's proposed reduction of the 2 ug/m3 standard to prevent cancer was scientifically unsound – a belief genuinely held by DOE scientists

at the time, in common with Brush. This scientific issue had nothing to do with CBD – the issue was only whether the standard should be lowered because beryllium exposure might cause lung cancer. Both DOE and Brush were convinced there was no good evidence for carcinogenicity.

Within a few years, **OSHA's** safety plan died.

This is a blatantly misleading statement. See **A** Chronicle of Reckless Reporting, "The Fiction of a Secret Deal."

Throughout the fight, one thing remained constant: Workers continued to be overexposed.

The ***other*** terms of "the deal," not stated in the article, were that Brush would not exit the beryllium business without giving the government advance notice and that **Brush would apply a meaningful portion of its profitability toward capital improvements designed to further environmental control of beryllium production.**

PLANTS RARELY INSPECTED; METAL'S USE NOT TRACKED

Today, more than 50 years after the disease was discovered, the rate of illness is higher than ever.

Until recently, the only way to diagnose CBD was after the disease had advanced far enough that it could be detected via **X**-ray examination of the lungs and pulmonary function testing. Now more sophisticated diagnostic methods have been developed to detect an individual's sensitivity to beryllium, meaning that we need not wait until symptoms are manifested to assess vulnerability to the disease. **However, this ability to detect sensitization and CBD earlier also means that more cases of beryllium-related medical conditions are being diagnosed.**

A study published in 1997 found that 1 in 11 workers at the 646-employee Elmore plant either have the disease or an abnormal blood test - a sign they may very well develop the illness.

To clarify this: the calculation is derived from a study that identified 59 of 646 employees as having a positive blood test. Of the 59, 24 displayed actual evidence of beryllium effect on the lung; the others had a positive blood test only. None were ill at the time.

And while dust counts at the Elmore plant are much improved, some remain over the legal limit, company records turned over in court cases show.

See below ...

OSHA is responsible for inspecting the plant and making sure dust counts are low. If not, inspectors can write citations and issue fines.

But years have gone by without an inspector setting foot in the plant, **OSHA** records show.

Not true. OSHA conducted comprehensive inspections in 1993 and 1997, along with numerous spot or "partial" inspections. In the '70s, the facility was thoroughly inspected twice, in 1974 and 1978, and in 1999 another comprehensive inspection was conducted.

When inspectors have found high dust counts, Brush Wellman has escaped penalties.

See below ...

In fact, OSHA records show, Brush has never paid one cent for high exposures at any of its several facilities nationwide.

That is true. Federal law provides that OSHA must be able to suggest economically and technologically feasible alternative processes whenever it cites an industry for high exposures to a chemical. **The agency has never been able to do that. Each time, Brush has been using the most state-of-the-art processes known to the industry.**

OSHA officials says there are simply not enough inspectors to regularly check the plants.

"We have about 2,000 compliance officers to cover 6 million work sites that employ more than 100 million workers," says **OSHA** spokesman Stephen Gaskill, who recently left the agency.

"So to say that we are spread thin is a severe understatement."

To make matters worse, no one knows what companies - from large corporations to small machine shops - are handling beryllium and whether safeguards are in place.

"There are beryllium-copper golf clubs now being used," says Dr. Peter Infante, OSHA's director of standards review. "Where are those being tooled and polished?"

Thousands of companies are believed to handle beryllium, but no one knows how many workers are potentially exposed. Estimates range widely, from 30,000 to 800,000.

Improvements, officials say, are in the works.

The Energy Department says it is spending millions to improve ventilation and air monitoring at government-owned sites. And Brush Wellman says it is improving equipment and work practices to reduce exposure.

Theresa Norgard, wife of disease victim Dave Norgard, of Manitou Beach, Mich., says she has heard such promises before.

"Tired, worn-out phrases," she says. '!Different time periods, same messages: 'Mistakes were made. Now we're doing better. We're doing everything we can.' "

Time and time again, she says, the government sacrificed the workers.

"They were just like pieces of equipment. They were disposable. They were dispensable. They weren't even seen as being human."

This is a statement the reporter fabricated out of thin air. See Part **2,** Article 3 for a thorough discussion of product stewardship.

We're sorry that Mrs. Norgard feels this way. At Brush Wellman, we value each and every man and woman. No one wants to solve this problem more **than** we do.

Part 1: Weapons over workers

You too may be at risk

BY **SAM ROE**
BLADE SENIOR **WRITER**

You don't have to be a beryllium worker to be at risk for beryllium disease.

If you've ever lived near a beryllium plant, you may be at risk. If you've ever toured a beryllium facility, you may be at risk.

And if you've ever bought a used car from a beryllium worker, you may be at risk.

Just a few paragraphs later, the reporter writes, "Nor is there a documented case of someone getting it from touring a beryllium factory or driving a car contaminated with dust from a worker's clothing." **So why did he suggest ". . . you may be at risk"?**

These risks may be extremely low, but they do exist, health officials say.

Overall, beryllium disease is a rare illness, almost exclusively affecting workers in factories and metal shops that produce or machine the material. But anyone is at risk if they have ever been exposed to beryllium dust.

Handling a finished beryllium product is not risky - unless you cut, sand, or otherwise alter it, creating dust.

It is unknown how much beryllium dust a person must breathe in to contract this often-fatal lung illness or how long a person must be exposed. Some people have become sick with seemingly insignificant exposures.

This is not **an** *often*-fatal illness. It is a sometimes-fatal illness.

But there is no known case of someone developing the disease after being exposed for only a few hours.

Nor is there a documented case of someone getting it from touring a beryllium factory or driving a car contaminated with dust from a worker's clothing.

Still, health officials say citizens should be aware of all potential risks. If not, people may develop the disease and never make the connection between their illnesses and beryllium.

"If somebody developed lung disease and had never worked in a setting in which they were likely to have been exposed to beryllium, it would be very unusual for a physician to pursue the question of whether they had beryllium disease," says Dr. Kathleen Kreiss, a beryllium researcher at the National Institute for Occupational Safety and Health.

And early detection is important because beryllium disease, though not curable, is treatable. Medication can extend the lives of victims for years.

Other than current and former beryllium workers, here are those who may be at risk:

CONTRACTORS

At least one contractor - an electrician from Tucson, Ariz. - has been diagnosed with beryllium disease after working in a beryllium plant.

George Faccio, 64, was in and out of the Brush Wellman Inc. plant in Tucson from 1983 to 1985. "His exposure to beryllium was really just walking around the plant, breathing the air," says his attorney, James Heckbert.

Mr. Faccio was diagnosed with the disease in 1994 after complaining of shortness of breath and fatigue, Mr. Heckbert says. The electrician is suing Brush Wellman, saying it did not warn him of the dangers.

Brush says it thoroughly warns contractors.

All persons entering Brush Wellman facilities are provided with information regarding **the** hazard of beryllium dust.

Brush goes to great lengths to protect its contractors. Measures include: (1) providing personal protective equipment and respirators where required – and training in the proper use of this equipment, **(2)** holding meetings focusing on the hazards of working with beryllium, including a "Working Safely with Beryllium" video and review of housekeeping, ventilation techniques, the protective clothing rules and locker room procedures, and **(3)** access to Brush medical and industrial hygiene personnel if necessary. Contractors who are required specifically to wear respirators must provide Brush with medical clearance documentation in advance, after which additional training is provided. This includes viewing a video entitled "Respiratory Protection – Another World," review of the limitations of respirators and explanation of the facial hair policy. After contractors begin work for the company, the Security Access Control Group, along with environmental, health and safety personnel, monitor contractor personnel to ensure that retraining and respirator medical clearance is performed annually.

RESIDENTS

In the **1940s** and 1950s, at least 41 residents living near beryllium plants in Ohio and Pennsylvania developed the disease through air pollution. Several victims died,

Citizens within five miles of the Reading, Pa., plant got the disease; residents within three-quarters **of** a mile of the Lorain, O., plant got sick.

There have been no documented air pollution cases since the 1950s, and Brush Wellman says residents near its plants are not at risk.

But records from the Ohio Environmental Protection Agency show that the amount of beryllium dust near Brush's main plant outside Elmore, **O.,** has been periodically over the **U.S.** safety limit.

That has only happened twice in the last decade; both times operations at the plant were shut down until the source was identified and corrected. What this doesn't point out is the magnitude of the external ambient air monitoring program. Beryllium emissions from the Elmore plant are regulated by the **U.S.** EPA. The standard is 0.01 ug/m3 as a monthly average concentration, measured in the vicinity of the plant rather than at the end of a stack. The plant was designed **to** meet this standard back in 1958, and monitoring has been ongoing since then – including on a voluntary basis from 1962 through 1973, after the AEC standard ceased to be applicable and before the EPA standard took effect. The present monitoring network consists of nine stations which operate continually; the network was designed in consultation with EPA and its efficiency confirmed by EPA following its own independent, year-long study. The monitoring data is collected weekly and reported to the EPA monthly. Typical sampling results are five to 10 times lower than the standard.

No studies have been done to determine whether residents in this rural area have been affected. Brush says it knows of no such complaints.

PEOPLE TAKING TOURS

Some health officials advise against taking tours of beryllium plants.

But Brush continues to give tours of its Elmore plant. Among those who have taken them: spouses of beryllium workers, Toledo congresswoman Marcy Kaptur, and news reporters.

When Brush held an open house last October, several members of the environmental group Ohio Citizen Action protested in front of the plant. "We're not convinced the inside of that plant is safe," says Sarah Ogdahl, the group's Toledo director.

Brush officials say it is highly unlikely anyone has been harmed by the tours. Operations are shut during the tours, and high-risk areas are off-limits.

But Brush acknowledges there is a risk of exposure. When asked whether someone could get beryllium disease by touring its plant, Brush administrator Marc Kolanz says: "We can only tell you what we know: In past history, we don't know **of** any cases that have originated from a tour at the plant."

As of June, 1999, *all* visitors are subject to new protective clothing rules and respirator protection requirements if they expect to go into targeted production areas as part of their visit. This eliminates the chance of exposure to levels of beryllium that might cause illness.

Ohio Citizen Action has no expertise in or any direct knowledge of Brush operations with which to make a judgment one way or the other.

RELATIVES

About two dozen people have contracted the disease from dust carried into their homes by beryllium workers.

Many victims have been women who shook out and washed their husbands' contaminated clothing.

These illnesses were discovered in the 1940s and 1950s, when beryllium plants did not have many of today's safeguards, such as showers and a change of clothes.

In the 40-plus years since these cases were reported, major improvements have made the workplace safer and cleaner, as the reporter acknowledges.

Since then, there has been only one known case of a person contracting beryllium disease outside the workplace. Carol Mason, a 64-year-old from Wood County, was diagnosed with the disease in 1990.

Her husband worked at the Elmore plant, but her exposure **to** beryllium was limited: She handled his work clothes twice, took two tours of the plant, and spent a week brushing metallic flakes from her husband's face and scalp after a work accident.

In 1997, a government study found that workers at an Alabama machine shop were leaving work with beryllium dust on their hands and clothes, spreading it to their cars and, presumably, their homes.

The workers' relatives have not been tested for early indications of the disease. If they were, a few cases might be found, says the study's author, Wayne Sanderson **of** the National Institute for Occupational Safety and Health.

ACQUAINTANCES

Mr. Sanderson says if you buy a used car from a beryllium worker, you should have it cleaned inside before you drive it. That's because his study found that workers at the Alabama machine shop were tracking beryllium dust into their cars.

"There were some workers that were significantly contaminating their vehicles," he says.

But the health risk "is probably not tremendous," he says, and there have been no illnesses reported from such exposures.

And Mr. Sanderson says that although workers were found to have beryllium dust on them, it is not dangerous to shake hands with them or sit next to them on the bus. "It's really highly unlikely that the short-term exposure you would get in those sort of situations would lead to chronic beryllium disease."

PART 2

DEATH OF A SAFETY PLAN

Part 2: Death of a safety plan

Industry, defense establishment twist a proposal to protect beryllium workers into a secret deal protecting their own interests

BY *SAM* ROE
BLADE **SENIOR** WRITER

It was supposed to be a plan to protect workers.

It was supposed to reduce the amount of toxic beryllium dust floating in many plants and machine shops.

And it was supposed to limit the number of workers developing an incurable and often-fatal lung illness called beryllium disease.

This is not true. The plan referred to was intended to protect workers against cancer, not against **CBD.** In 1975, an **OSHA** pamphlet stated that "the level allowed under the present standard is adequate to protect workers from excessive beryllium exposure.'' That same year, it just so happened that **OSHA** issued a generic cancer policy that was widely opposed by industry. **As** part of that policy, a proposed beryllium standard was issued.

That was the plan at least.

But this simple plan - proposed by federal regulators in 1975 - would eventually die, replaced by something far different.

For what started as a government effort to protect workers from this rare but dangerous metal was slowly twisted into a secret arrangement protecting government and industry,

This is patently untrue. See A Chronicle of Reckless Reporting, "The Fiction of a Secret Deal,"

First, the safety plan was attacked by the beryllium industry.

The reasons why it was attacked, which were not covered in the series, follow. **The so-called safety plan had nothing to do with CBD; it was driven by an attempt on the agency's part to craft what was referred to as a "generic cancer policy."**

The purpose of the policy was to remove any need to debate the carcinogenicity of chemicals on an individual basis. Instead, **OSHA** would have the administrative authority to define carcinogens as any material that induced tumors, benign or malignant, in two or more animal species. The permissible level would be the lowest level attainable, based not on current capability but on assumed future technological advances. The issue of cancer was one that Brush had suggested to the AEC more than ten years earlier – in **1963** – be examined in an epidemiological study of beryllium workers. Up to this point, poor quality experiments with animals showed beryllium exposure caused tumors, but the industry was hoping for a sounder scientific basis on which to make that determination. Requests for proposals were issued but never moved forward due to competing priorities at the AEC. In **1965,** Brush and the other leading beryllium producer, The Beryllium *Corp.*, again requested epidemiological studies, this time to the **U.S.** Public Health Service, and they were successful. (OSHA did not exist at this time). The two studies that were ultimately conducted showed no evidence of human carcinogenicity. These studies were never published because the lead researcher's immediate superior at the Public Health Service disagreed with the outcome. That same superior, Joseph Wagoner, and one of his colleagues, Peter Infante, would ***go*** on to work at **OSHA** during the time of the **1975-1977** standard controversy, and they claimed to have data that contradicted the theory that beryllium was not a human carcinogen. In the final analysis, the bulk of the several-week **OSHA** hearing record was devoted to this debate about methodology and the various conflicting studies. The beryllium industry, along with most of the leading beryllium researchers of the day, felt it was essential

to challenge the biased scientific process that was being used to promulgate a new, more restrictive standard. They took their concerns to the highest levels of government, which ultimately involved the secretaries of the Departments of Labor, Defense, Energy and Health, Education & Welfare. And in the end, the plan did not go forward.

Then several **U.S.** senators - all of whom had beryllium plants in their states - stepped in.

Then came the defense establishment: Energy Secretary James Schlesinger and Defense Secretary Harold Brown. They feared the plan would cut off beryllium supplies for nuclear bombs and other weapons, and that would "significantly and adversely affect our national defense," Secretary Schlesinger wrote to two cabinet members at the time.

In fact, the Energy Department, which is responsible for maintaining the nuclear arsenal, **was** *so* concerned about beryllium supplies that it struck a bargain with the Brush Wellman beryllium company, government and industry documents show.

The government got its valuable beryllium for years to come, and Brush Wellman got more money, a virtual monopoly on government work, and assurances that defense officials would lobby against the safety plan.

Recognizing that the beryllium industry needed some resolution on the question of control and regulation of production processes, DOE agreed to fund a research program to examine these issues from **an** industrial hygiene perspective. **It** also pledged to work with **OSHA** to demonstrate that **OSHA's** proposed reduction of the **2** ug/m3 standard to prevent cancer was scientifically unsound – a belief genuinely held by DOE scientists at the time, in common with Brush. This scientific issue had nothing to do with CBD – the issue was only whether the standard should be lowered because beryllium

exposure might cause lung cancer. Both DOE and Brush were convinced there was no good evidence for carcinogenicity. DOE further agreed to a price adjustment that would afford Brush the same profitability from the government's business as it was earning at that time in its commercial business, and that it wouldn't produce beryllium in direct competition with Brush.

Within a few years, the safety plan died.

"It was a terrible disappointment," recalls Eula Bingham, former director of the U.S. Occupational Safety and Health Administration, which had proposed the plan.

The plan remains the only significant effort by the U.S. government in 50 years to tighten controls on the beryllium industry. This is true even though beryllium workers continue to become ill and die from inhaling the metal's dust.

About 1,200 people have contracted beryllium disease - 127 at Brush Wellman Inc., the Cleveland-based mining and beryllium company with plants in several states. Fifty workers have contracted the disease at Brush's main plant outside Elmore, O., 20 miles southeast of Toledo.

Perhaps what is most remarkable about the safety plan is not that it failed, but how it failed.

How industry executives, sensing they could not defeat the plan on its merits, huddled with their lawyers and devised a strategy of attack.

How several members of Congress, responding to industry concerns, went to bat for the industry even though the record clearly showed that the beryllium business was harming workers.

How defense officials, fearing beryllium would no longer be available, cut a deal to keep an aging, unsafe plant open.

"**A** lot of this," retired Brush Wellman executive Stephen Zenczak says, "really gets into inside dirty linen."

Over the last **22** months, The Blade has pieced together the death of this safety effort, using thousands of industry documents disclosed in recent court cases as well as government records obtained through federal Freedom of Information requests.

Among the documents: a recently declassified Energy Department report on beryllium supply problems and the transcript of a candid talk by Brush executive Martin Powers at **a** company seminar. In his talk, Mr. Powers details Brush's legal maneuverings to quash the safety plan.

"It was not intended that [my talk] be recorded," Mr. Powers, now retired, recalls. "I didn't know it was being taped."

In total, the industry and government documents show how the regulatory process can be slowly undermined. Moreover, the records provide a rare window into the inner dealings of what President Eisenhower called "the military industrial complex" - an economic and political alliance he so firmly warned against.

The truth about this episode is spelled out in Brush Wellman's response to ***The Blade*** later in this article.

Officials deny any wrongdoing in the safety plan's demise, saying it was not needed in the first place.

Mr. Zenczak, a senior Brush Wellman manager who helped cut the deal with the government, **says** the company did not sabotage the regulatory process. Rather, he says, Brush was simply fighting back against zealous safety regulators who were trying to "make an example of us and hang us up as a trophy."

Jerry Evans, an Energy Department official who has handled beryllium issues for the government for years, says the safety plan was never valid because its underlying scientific data were flawed - an argument the beryllium industry has also made,

This is absolutely true.

Still, two federal agencies were convinced that tougher controls were needed, and an independent panel **of** experts confirmed the safety plan's underlying science.

Throughout the fight, one fact remained constant: Workers continued to contract beryllium disease, which eats away at the lungs and proves fatal about one-third of the time.

This prognosis of fatality for CBD patients was based upon early experience. It is no longer meaningful, in light of modern diagnostic techniques and treatments. The frequency of fatality depends entirely on the time frame in question and when the diagnoses were made.

EISENHOWER **WARNS ABOUT ARMS INDUSTRY**

In his farewell address in **1961,** President Eisenhower offered America a warning: The nation, he said, "must guard against the acquisition of unwarranted influence, whether sought or unsought, by the military industrial complex. The potential for the disastrous rise of misplaced power exists and will persist."

The nation's small beryllium industry is hardly what President Eisenhower was talking about when he referred to the "military industrial complex." This is nothing more than a rhetorical device.

Such comments were surprising coming from Mr. Eisenhower, the supreme commander who led the Allies to victory in Europe in World War 11 and who, as president, was considered a friend of business.

Yet he warned of the "grave implications" of the massive arms industry.

Until World War 11, he noted, America had no such industry. **Now,** it had a "permanent armaments industry of vast proportions."

The beryllium business was a small but vital part of this Cold War economy.

To give you an idea, the **1998** defense budget was **$243** billion, compared with Brush Wellman income of $409 million, about five percent of it from aerospace and defense work.

And Brush was a key beryllium supplier, enjoying significant government support.

In **1949,** for example, the government paid Brush to build and operate a plant in nearby Luckey. Later, the government subsidized a Brush facility a few miles away near Elmore.

It wasn't a subsidy, but rather a guaranteed supply contract which was consistent with government procurement practices then and still **is** today.

The U.S. Atomic Energy Commission was in charge of overseeing safety conditions at the plants, but it was also responsible for ensuring that nothing disrupted beryllium supplies - duties often at odds with one another.

And for several years in the 1960s, when the contractual restraints on Brush loosened, no federal agency oversaw worker safety.

In fact, OSHA didn't exist before 1970. No one agency was designed for that express purpose in those days, although the U.S. Public Health Service existed and was active all during the time frame of this series. In addition, monitoring at Elmore has been continuous, including the period between 1962 and 1974 after the AEC contractual standards ceased to be applicable to its operation and before the EPA standards took effect. This was done voluntarily by Brush as part of its overall environmental and occupational health and safety program.

That would change in the 1970s.

America was now focusing less on the Russians and more on social issues, such as civil rights, the women's movement, and the environment. Several historic laws were passed, including one in 1970 that created the Occupational Safety and Health Administration.

Now there was a federal agency - one wholly independent of industry - that could set safety standards, inspect factories, and fine violators.

It was only a matter of time before these two entities - OSHA and the military industrial complex - would collide.

SAFETY PROPOSAL STUNS, ANGERS BRUSH WELLMAN

For the beryllium industry, that collision occurred Oct. 14, 1975. That day, OSHA held a news conference to announce it planned to crack down on beryllium.

The agency said a dozen workers a year were being diagnosed with beryllium disease. Moreover, **OSHA** said, studies suggested the metal caused cancer. So **OSHA** proposed cutting the worker exposure limit in half - from **2** micrograms of beryllium dust per cubic meter of air to 1 microgram.

The amounts of dust were small: *2* micrograms is equivalent to the amount of dust the size of a pencil tip spread throughout a 6-foot-high box the size of a football field.

But the proposal to cut the limit was not small: The beryllium industry would probably have to spend millions of dollars on new safety equipment and lose customers unwilling to do the same.

Brush Wellman executives were completely blind-sided by the **safety** plan. They had no idea it was coming, and they knew nothing of the news conference.

In fact, top Brush officials did not learn of **OSHA's** announcement until the day after the news conference - and then perhaps in the worst possible way.

Brush chairman and **CEO** Robert Biggs **was** on his way to a board of directors meeting, and just before he arrived, he picked **up** a newspaper and saw an article about OSHA's plan.

He was furious. He showed the article to board members and blasted Brush executive Martin Powers, who had been monitoring **OSHA's** activities and had assured him the firm had nothing to fear.

Luckily for Mr. Powers, he was out of town.

"My understanding is that Biggs tore me up and down, said that I had lied to him," Mr. Powers later told Brush managers in the candid, tape-recorded talk.

Mr. Powers was summoned back to the office. By the time he arrived, Mr. Biggs had cooled off - "enough that he decided not to fire me, but not enough that he was willing to talk to me," Mr. Powers recalled.

The two met with Brush's attorneys at Jones, Day, Reavis & Pogue, the Cleveland-based law firm that is one of the largest and most prestigious in the nation.

"Biggs wanted this thing fought, and he wanted it fought with every weapon we had," Mr. Powers recalled. "It was to be a first priority in everything in the company and that he expected it to be the first priority at Jones Day."

LOSING THE ARGUMENT, BRUSH SWITCHES STRATEGY

Jones Day assigned one of its top lawyers to the matter, Patrick McCartan.

A former law clerk to **U.S.** Supreme Court Justice Charles Whittaker, Mr. McCartan would one day go on to become one of the nation's leading attorneys. Today he is managing partner of Jones Day.

Joining him on the Brush case was John Newman, Jr., a graduate of Harvard Law School.

In a 12-page internal memo, Brush laid out its strategy for fighting **OSHA:** The firm would challenge the merits of **OSHA's** plan - attacking the underlying research, for example - but Brush would also rely on "informal pressures."

Again, the lack of scientific support for the proposed standard was the basis of Brush Wellman's opposition.

Brush officials, the memo states, should talk with several members of Congress "to see what they can do to help and what suggestions they might have with respect to others who might have an effect upon Labor Department policies."

And Brush should talk with the Atomic Energy Commission, the Defense Department, and the Commerce Department "to find out as much as we can about what common interests they may have to motivate their support."

Over the next two years, from 1975 to 1977, Brush vigorously fought OSHA's plan, submitting rebuttals, lining up witnesses for public hearings, and soliciting more than 100 supportive letters from customers.

The battle came to a head in Washington in 1977, when OSHA held three weeks of public hearings on the matter.

At first, Brush stuck to its strategy of fighting the plan on its merits. The company argued that the tighter exposure limit was not needed and that it was technologically and economically impossible to achieve.

But toward the end of the hearings, company records show, Brush's lawyers acknowledged things weren't going well. In fact, Brush was going to lose.

And if Brush challenged the outcome in court, the lawyers said, Brush would probably lose again. The courts seldom overturned such decisions - unless the government had been deliberately unfair. If Brush could prove that, it might have a chance to win.

Brush officials immediately switched strategies.

"We decided that the only chance we had was to indict the government for bad faith," Mr. Powers told Brush managers in 1986 at the seminar that was tape-recorded,

Brush believed that certain government officials were acting in bad faith by relying on biased studies that were subsequently discredited, as explained in A Chronicle of Reckless Reporting, "The Fiction of a Secret Deal."

So when it was Mr. Powers's turn to speak at the hearings, he blasted **OSHA's** research arm, the National Institute for Occupational Safety and Health, saying it had concealed information, misused its power, and treated the beryllium industry as "the enemy."

OSHA, he declared in his written statement, just wanted to appear to be "doing something" about beryllium. He called the agency's plan "an arbitrary and capricious misuse of regulatory authority."

Brush's strong words didn't change much.

When the hearings ended, **OSHA** moved ahead with its safety plan.

U.S. SENATORS PUT PRESSURE ON PLAN

Brush Wellman did not give up.

Shortly after the hearing, the company started "a publicity campaign," according to Mr. Powers's 1986 talk with Brush managers.

One action that captured attention: Eight scientists - at least four of them Brush consultants - wrote a scathing letter to two cabinet members.

The letter was in line with Brush's new attack-the-government strategy: The scientists called the federal regulators' cancer studies on beryllium "shocking examples of the shoddy scholarship and questionable objectivity utilized in making important national regulatory decisions."

What ***The Blade*** deems an "attack-the-government strategy" is Brush Wellman's consistent and accurate depiction of a government standard based on poor science.

Such studies, they wrote, "do the nation a disservice."

None of the scientists identified themselves as beryllium industry consultants.

They were known to be consultants to the industry as *The **Blade**'s* next sentence shows.

In fact, three had testified on behalf of Brush Wellman at the recently completed OSHA hearings.

The scientists' letter was sent to Labor Secretary Ray Marshall and Health, Education, and Welfare Secretary Joseph Califano, Jr., and subsequently released by a Washington-based public relations firm.

That same letter wound up in the hands of several members of Congress. These lawmakers, in turn, started writing letters to Carter administration officials, expressing concern about the scientific basis of the safety plan.

Among those who wrote letters: Sen. John Glenn of Ohio, Sen. Orrin Hatch of Utah, and Sen. Richard Schweiker of Pennsylvania - all from states with beryllium plants.

Senator Hatch weighed in several times. In a letter to HEW Secretary Califano, the senator said he was "deeply concerned" by the scientists' letter and called for a "truly independent review" of beryllium.

"I feel that it is the mutual responsibility of the Administration and the Congress to guarantee the integrity and reliability of the studies and of the rulemaking process," Senator Hatch wrote.

Senator Glenn also wrote to **HEW** Secretary Califano, calling for a review. And Utah Sen. Jake Garn told Energy Secretary James Schlesinger that he, too, didn't want the rule adopted prematurely.

But Senator Garn's interest went beyond the opinions raised by a few industry scientists.

A member of the Armed Services Committee, he **was** concerned how the safety plan might affect America's ability to build nuclear weapons.

That was a concern of defense officials, too.

DEFENSE OFFICIALS CITE NATIONAL SECURITY RISK

At first, defense officials didn't take much interest in the safety plan.

Few testified at the OSHA hearings in the fall of **1977,** and few submitted written comments.

But after the hearings were over, and adoption of the safety plan appeared imminent, they grew increasingly concerned.

One reason: They learned that stiffer regulations might drive an important yet financially strapped beryllium supplier, Pennsylvania-based Kawecki Berylco Industries, out of the metal business.

Now, "the full significance of the proposed standard impact was appreciated," a recently declassified government report states.

So in January, **1978** - about the same time Brush Wellman began its "publicity campaign" – defense officials created a beryllium task force.

Its stated mission: to study what impact **OSHA's** safety plan would have on the beryllium industry and **U.S.** supplies.

But Mr. Powers, the retired Brush executive, told his colleagues at the **1986** seminar that defense officials informed Brush that the task force was set up "to try to get the **OSHA** thing reversed."

Four months after it was created, the task force concluded in a report that the **OSHA** plan had serious national security implications.

It said the nation's two main beryllium producers - Brush Wellman and Kawecki Berylco - would likely stop making beryllium for the government if the safety plan were adopted. Both companies made little money on government orders, and so the firms would rather shut certain operations than invest millions of dollars on new safety equipment.

If the government wanted to pay for the improvements or build its own beryllium plant, the cost would be high: tens of millions of dollars.

Reconsideration of the **OSHA** cancer policy was only one facet of the task force's work. Ensuring a dependable supply of beryllium was the overriding objective of the group.

The task force concluded the bottom line was this: The Energy Department needed several tons of beryllium each year. If supplies were cut off, there would not be enough beryllium in the stockpile to last two years.

In a memo to top defense officials, the Energy Department's **J.K.** Bratton recommended that the Energy and Defense departments express these national security concerns to **U.S.** health and labor officials.

Such letters, he said, would likely "moderate" **OSHA's** safety plan.

Energy Secretary Schlesinger took the advice: In August, **1978,** he wrote identical letters to Labor Secretary Marshall and HEW Secretary Califano. A copy was sent to National Security Adviser Zbigniew Brzezinski at the White House.

Mr. Schlesinger warned that if the safety plan were adopted, the costs of complying with the regulations might drive beryllium firms out of the metal business and cut off **U.S.** supplies.

"The loss of beryllium production capability would seriously impact our ability to develop and produce weapons for the nuclear stockpile and, consequently, adversely affect our national security."

And that, he said, would be "unacceptable."

Substitutes for beryllium, he wrote, could not be used in existing nuclear weapons without testing the bombs to verify performance. "In some cases, full-yield testing would be necessary."

Weapons under development would have to be redesigned, and that "would require a long-term major investment and would incur significant penalties in performance, safety, and cost."

Mr. Schlesinger concluded by asking Secretary Califano to conduct an independent review of **OSHA's** basis for the safety plan.

Defense Secretary Harold Brown made a similar request, calling it a matter of "national interest."

In the end, Secretary Califano agreed to an outside review.

This pleased Senator Hatch, who had lobbied Mr. Califano for such a move.

"My congratulations for your excellent judgment," the senator wrote.

The following month, October, **1978,** a panel of seven nongovernment scientists convened in Atlanta. They reviewed the cancer studies on beryllium and heard from industry, labor, and **OSHA** representatives.

The experts' conclusion: The science behind the safety plan was valid.

Finally, it appeared that work places handling beryllium would be made safer.

U.S., BRUSH WELLMAN STRIKE AN AGREEMENT

Then something happened that changed everything.

In May 1979, the Cabot Corp., now the owner of Kawecki Berylco, did exactly what defense officials feared: It dropped out of the pure beryllium metal business after repeatedly losing money in that venture.

That left Brush Wellman as the sole supplier in the non-Communist world of the kind of beryllium that America needed for weapons.

And Brush was losing money in the beryllium business as well.

Needless to say, this put Brush in a strong negotiating position.

Brush executives soon met with defense officials in a series of discussions at the Energy Department's headquarters outside Washington and at its Albuquerque, N.M., office.

The classified meeting was called by DOE to discuss its and DOD's concerns about maintaining a reliable supply of beryllium for the strategic weapons program. There wasn't then – and isn't now – any substitute for beryllium in these applications. The concerns about the potential loss of that essential supply, with Kawecki Berylco now out of the business, were undoubtedly a military secret.

At a meeting in June 1979, a deal was struck, government and Brush documents show. Brush promised to continue to supply the Energy Department with beryllium for its weapons; in return, the agency promised to: Pay Brush a one-time **35** per cent price increase.

The price adjustment would afford Brush the same profitability from the government business as the company was earning at that time in its commercial business.

Not develop other sources of beryllium,

The implication here is that Brush would be guaranteed a monopoly, which is not the case. The government agreed not to compete directly with Brush by funding a production facility being contemplated at Rocky Flats that would have been a government-owned, contractor-operated facility like Brush's Luckey facility. However, at least three domestic and one foreign private ventures formed in the ensuing years.

Try to persuade OSHA to drop its safety plan.

Again, what DOE did **was** pledge to work with OSHA to demonstrate that OSHA's proposed reduction of the **2** ug/m3 standard to prevent cancer was scientifically unsound – a belief genuinely held by DOE scientists at the time, in common with Brush. This scientific issue had nothing to do with CBD – the issue was only whether the standard should be lowered because beryllium exposure might cause lung cancer. Both DOE and Brush were convinced there was no good evidence for carcinogenicity.

Former Brush executives Stephen Zenczak and Martin Powers were at this meeting and confirm in interviews with The Blade that these were the terms of the deal.

Brush also pledged not to exit the beryllium business without giving the government advance notice and to apply a meaningful portion of its profitability toward capital improvements designed to better control beryllium production.

Mr. Powers, testifying under oath in a recent court deposition, explicitly stated that this **was** the agreement.

And no action was taken contrary to the terms of the deal.

In addition, Energy Department files contain four separate letters from Brush that detail the agreement. The letters repeatedly stress the importance of the deal to Brush's future business plans.

In one, Brush explicitly states that if the government didn't live up to the agreement, Brush would get out of the beryllium business.

Mr. Zenczak, who retired from Brush in **1987** as vice president and general manager of the company's metals and minerals division, says the government never put the agreement in writing. That's why Brush repeatedly sent letters to the weapons officials outlining the deal.

"We put them on notice as to what our understanding was, the theory being that if they disagreed with it, we would hear from them. We never had a rebuttal."

In fact, in 1985, Brush's Mr. Powers met with Energy Department officials and outlined the history of the deal. He mentioned the written confirmations that Brush had sent to the government and then suggested that the lack of a government rebuttal was tantamount to acceptance.

Even knowing this, the government did not object.

One of Brush's letters was sent to the Energy Department's Dr. Richard Jiacoletti, who has since died. His replacement, Jerry Evans, a senior program engineer, has handled beryllium issues ever since.

He confirms that the government never answered Brush's letters. He speculates that is because Energy officials did not agree with Brush's understanding of any agreement.

At this point in the beryllium industry's history, neither Brush nor KBI had very high production volumes. Brush was incurring serious financial losses at Elmore, and KBI obviously decided it was no longer worth remaining in the business at all. Brush was considering shutting down that operation altogether.

"This is my opinion, and it may or may not be factual, but I believe that Brush has greatly exaggerated what they felt they walked out of that meeting with," says Mr. Evans, who was not at the meeting and was not working for the Energy Department when the deal was cut.

He did confirm a portion of the deal: The Energy Department agreed to pay a price increase when Brush became the sole beryllium supplier.

Mr. Zenczak, the former Brush executive, says he thinks Energy officials didn't put the deal in writing because it was potentially embarrassing. "That's the nature of the bureaucrats: Never write something that five years later somebody might dig up and accuse you of."

He says the deal was cut unbeknownst to **OSHA** and that Energy officials gladly accepted the terms, including the promise to try to persuade **OSHA** to drop its safety plan. "Actually, they were relieved we weren't going to [go out of the beryllium business]."

One additional note: When Brush spelled out the deal in a **1984** letter to the Energy Department, it did so in great detail. The company wrote that it wanted to provide the necessary background for a new request: Brush proposed building a new beryllium plant – provided that defense officials gave the company additional "protective assurances" on competition.

Defense officials met to discuss Brush's letter and request, but in the end, a new plant was not built, ***so*** additional "assurances" did not apply.

According to handwritten notes from that meeting, copies of which were obtained through a Freedom of Information request, a defense official wrote:

"Assurances cannot be in writing this time either."

PLAN DIES; OSHA HEAD BLAMES 'POWERFUL VOICE'

Within a few years of the 1979 deal between Brush and defense officials, OSHA's safety plan died.

It should be remembered that OSHA's safety plan had to do with cancer, not with CBD, which is the focus of this entire series.

Concerted governmental opposition played **a** pivotal role in its demise.

Eula Bingham, OSHA's director at the time, says Defense Secretary Brown's and Energy Secretary Schlesinger's opposition to the plan in 1978 was instrumental in the plan's death. "It was **a** very powerful voice," she says.

Dr. Bingham, now a professor of environmental health at the University of Cincinnati says her boss, Labor Secretary Ray Marshall, told her that the plan would not go forward because Mr. Brown and Mr. Schlesinger opposed it,

Mr. Marshall is now a retired professor at the University of Texas. A spokeswoman says he did not recall much of the issue and could not comment.

Likewise, his former Carter administration colleagues - Defense Secretary Harold Brown and National Security Adviser Zbigniew Brzezinski - say they did not remember the matter and could not comment.

Former Energy Secretary James Schlesinger is now with the Center for Strategic and International Studies, a public policy research institution in Washington. Through a spokeswoman, he says he recalls the issue but feels his 1978 letter detailing his concern with OSHA's plan speaks for itself.

Carter White House Science Adviser Frank Press says he recalls the beryllium controversy, but no details.

"There are hundreds **of** these kind of issues," says Dr. Press, now a technology consultant in Washington.

Former Brush executives Mr. Powers and Mr. Zenczak say that defense officials in 1979 clearly promised **to** try to persuade **OSHA** to drop its safety plan. But they say they don't know exactly what, if any, action they took.

Says Mr. Zenczak: "It **was** my understanding that [defense officials] made it known how critical this material was to their programs. That was one **of** the reasons why **[OSHA]** backed off and went on to other things."

MORE HIGH EXPOSURES, MORE WORKERS GET ILL

Brush Wellman's deal-making with the government wasn't over.

One last issue had to be resolved: the condition of Brush's aging metal plant near Elmore - the plant where government materials were made.

It's this kind of incendiary language which robs these articles of balance and fairness.

At the time, about 1979, workers at the plant were being exposed to extremely high levels of beryllium dust, company records show.

The dust, Brush's Mr. Powers recalls, was "impossible to control."

So Brush wanted the Energy Department to help pay for a new facility.

Although that request never went far, Energy officials did give Brush $3.5 million in 1982 to study the problem.

One of the main questions that the study posed was: Could the Elmore plant produce 100,000 pounds of beryllium annually for the government and not expose workers to levels of dust over the legal limit?

The company's conclusion: No.

Still, Brush went ahead and produced that amount - and more - two out of the next three years.

As a result of this study, Brush invested some $20 million in improvements to its beryllium production processes.

More specifically, the study did not reveal any process that was superior to the magnesium reduction process which was then and still is being used. It also showed that, at **a** point where production was increasing dramatically, the most critical processes were actually becoming more compliant. **The study did result in numerous recommendations to improve environmental control of the existing processes, most of which were implemented with favorable results.** Subsequently, in 1989, the National Materials Advisory Board of the National Research Council reported its own study along the same lines, which essentially confirmed the findings of the Brush study.

And as predicted, workers were exposed to unsafe levels - some four times the legal limit, the Brush study shows.

One of the Brush officials involved in the study was Marc Kolanz, the company's current director of environmental health and safety.

When asked why Brush proceeded with a production schedule that guaranteed workers would be overexposed, he said: "I don't know the answer to that question."

Brush records show that several workers who were overexposed during this period went on to develop beryllium disease.

One victim recalls having coughing fits at the plant.

"I was coughing so hard I was close to passing out," says the victim, who requested anonymity. "I had to hold onto barrels to keep myself up."

In all, **47** Brush Wellman workers have contracted beryllium disease since 1975 - the year **OSHA** proposed its ill-fated plan.

See A Chronicle of Reckless Reporting, "The Fiction of Knowing Overexposure to Unsafe Conditions" for a full discussion of this.

Part 2: Death of a safety plan

From bombs to toys: As Cold War needs waned, beryllium found its way into consumer products

BY SAM ROE
BLADE SENIOR WRITER

Beryllium has long been used in nuclear weapons, jet fighters, and the space shuttle.

Not exactly household items.

But in recent years the highly toxic metal has been increasingly used in common consumer products, such as computers, televisions, and cell phones.

It's even in golf clubs, sunglasses, pen clips, and dentures.

This has some health officials and scientists concerned. They think using beryllium for products such as golf clubs is an unnecessary risk to the workers who make them and the consumers who use them.

"Those are frivolous uses of a substance as toxic as this," says Dr. Peter Infante, director of standards review for the U.S. Occupational Safety and Health Administration,

Beryllium products are not toxic or hazardous in solid form – the form in which the public uses them – and these products perform useful, often critical, functions. Items manufactured from Brush products save lives. They include air bag sensors, fire extinguisher sprinkler heads, x-ray windows for mammography, pacemakers, landing-gear bearings, satellites for severe weather forecasting and defense counter-measures components.

Beryllium often causes a lung disease when its dust is inhaled. Scientists say there is no documented case of a consumer getting sick from a finished beryllium product, such as a golf club. But they say there is reason for concern.

Researcher Dr. Donna Cragle says consumers could harm themselves if they sanded or sawed a beryllium golf club, possibly creating toxic dust.

"Sawing it would put some of it into the air, you breathe it in, and there you go," says Dr. Cragle, director of the Center for Epidemiologic Research at the Oak Ridge Institute for Science and Education in Oak Ridge, Tenn.

Likewise, sanding or otherwise altering other beryllium products could be risky, researchers say.

And as beryllium use increases, so does the number of manufacturers handling the metal - perhaps without proper safeguards.

Brush's comprehensive program of product stewardship ensures that our customers have the kind of information and resources they need to be as educated as possible on the occupational health issues associated with beryllium. These resources include: the most current Material Safety Data Sheet (MSDS) with the first order of the year; update letters on health, safety and medical surveillance; access to the Beryllium Consultant Network; customer safe handling videos; on-site customer employee hazard communication training; on-site customer workplace industrial hygiene assessments; a highly-trained internal sales and marketing force; a 24-hour health and safety information service; Internet access to MSDS; and outreach at American Industrial Hygiene Association conferences.

In the dental industry, at least two laboratory technicians have contracted beryllium disease, and thousands of others who manufacture crowns, bridges, and dentures are at risk, researchers say. Beryllium is added to these items to improve their durability.

One of the lab workers who got the disease, a 28-year-old woman, didn't personally handle beryllium, but she worked in a room where it was ground, cast, and polished.

Dr. Milton Rossman, a Pennsylvania physician who has seen numerous beryllium victims, says he is unaware of any dental patient becoming ill from crowns, bridges, or dentures that contain beryllium.

Beryllium is alloyed with nickel at about 1.5 percent for use in dental applications. The dental industry's use of this alloy in fillings, crowns, bridges and dentures makes for comfortable and long-lasting solutions to many dental problems. This end-use of nickel beryllium improves the quality of life with no associated health risk.

Dr. Eula Bingham, director of **OSHA** under the Carter administration, says beryllium shouldn't be used in the dental industry.

"It's one thing if your country is in a Cold War, and you have to use something. And there may be even some rationale for using beryllium for space exploration." But using beryllium for dental prostheses is a different matter, she says. "There's no excuse for that."

Dr. Bingham is drawing a meaningless analogy between Cold War high beryllium content applications and consumer products which are low beryllium content (alloy) applications. The risks associated with each are entirely and fundamentally different.

Others are worried about beryllium scrap from consumer products.

Actually, the industry's record of scrap recycling is impressive. Beryllium is **a** highly valuable recycle material. In the last three years alone, Brush purchased more than 16 million pounds of beryllium-containing scrap material for recycle back into production processes. Brush has a long history of investing in its recycling capability. In 1986, Brush invested roughly **$12** million in a dedicated copper and beryllium recycling facility.

"After **20,** 50, 100 years you are going to have piles of beryllium all over the place," says Dr. David Groth, a cancer researcher who is retired from the National Institute for Occupational Safety and Health.

This statement has no basis in fact.

Historically, beryllium has been used mainly in the defense industry. But the end of the Cold War sent beryllium-makers scrambling for other markets.

This **is** *not* true. Even at its peak (1985-89), the defense **part** of the business was only **30** percent of the total (it's about five percent today). In modern times, Brush's primary business is in beryllium alloys, and that has chiefly commercial applications. For many years beryllium has been valued in such applications as mainframe computers, fire extinguisher sprinkler heads and non-sparking tools.

Beryllium has many commercial uses because it is strong, lightweight, and heat-resistant. When small amounts - typically **2** per cent - are mixed with copper, a remarkably elastic alloy is formed.

Beryllium compounds and alloys can now be found in tiny connectors in computers, relays in cell phones, and air-bag systems in cars.

No one knows how many manufacturers use beryllium, but Brush Wellman Inc., America's leading beryllium producer, reports having thousands of customers, including Ford Motor Co., General Motors Corp., and Motorola, Inc.

Brush Wellman officials say beryllium is often in **parts** so tiny that consumers are not going to be tearing them apart and sanding them. And they emphasize that simply touching a piece of beryllium is not dangerous.

But the company says consumers should not do anything to beryllium products that creates dust.

"It's probably a pretty low likelihood that it is going to cause a problem," says Marc Kolanz, Brush's director of environmental health and safety, "but again, the exposure potential is there."

He says a Utah man once told him he was using beryllium-copper to make replica law enforcement badges in his garage. "He was concerned the [Environmental Protection Agency] was going to find him out. My concern was him." The man was using a respirator, Mr. Kolanz recalls, but the wrong kind.

Brush generally doesn't make finished beryllium products, but it supplies customers with the rods, tubes, and wire from which many beryllium products are made. Brush says it warns its customers about the hazards of beryllium, but after that, it is up to them to pass the warnings on to consumers.

One product that has raised concerns: golf clubs. Small amounts of beryllium are mixed with nickel or copper to make the heads of putters and wedges.

"The putters are all over the place," says Brush spokesman Timothy **Reid,** who recently left the firm.

Many professionals have used beryllium clubs, he says, including European star Bernhard Langer.

Karsten Manufacturing Corp., the parent company of Ping, a leading producer of golf equipment, says it has made beryllium clubs for years, has known about the hazards, and **has** never had a worker contract the disease.

"We are very, very careful to make sure our worker safety is first and foremost," says Rawleigh Grove, attorney for the Phoenix-based corporation.

He says his firm does not put warning labels on the clubs and has never had a consumer health complaint.

In Formula One auto racing, beryllium is used in the brakes to allow for quicker stops. And the metal has been used in racing bike frames. Bicycling magazine called a $25,000 prototype a "weightless wonder" and said beryllium, compared to other metals, seemed "positively unearthly."

Other commercial uses: Metal artists work with beryllium-copper, which has a golden luster. Beryllium is in propellers on motorized toy boats. **A** recent model show at Toledo's SeaGate Centre was selling such items.

Beryllium sunglasses by Fila USA, Inc., a sporting goods and apparel firm, are advertised on the Internet.

Gary Renwand, a former **Brush** Wellman worker who contracted the disease at the company's plant near Elmore, O., says he doesn't understand why beryllium is used in so many products.

"**I'm** not saying we shouldn't have advances," the 61-year-old from *Oak* Harbor says, "but let's advance with the right care for people."

These toys come equipped with a product advisory that warns against filing, sanding, grinding or otherwise creating conditions that could produce respirable dust.

PART 3

WORKERS MISLED

Part 3: Workers misled

Lethal exposure: Brush misled workers, regulators about dangers

BY *SAM* ROE
BLADE SENIOR WRITER

The nation's leading producer of the metal beryllium has repeatedly misled workers, federal regulators, and the public about the dangers of the highly toxic material.

This accusation is completely unfounded, and is refuted throughout this document and in **A** Chronicle of Reckless Reporting.

Brush Wellman Inc. knew for decades that its plants were consistently exposing workers to unsafe levels of beryllium.

The company simply did not know or believe that workers were being exposed to levels that would cause them to contract CBD. This is discussed in great detail in **A** Chronicle of Reckless Reporting, "The Fiction of Knowing Overexposure to Unsafe Conditions."

Yet the company implied to workers that the plants were safe and downplayed the risks of beryllium in employee handouts, instructional videos, and warning letters new employees had to sign.

Brush has provided information to its employees based on the state of knowledge at the time'and has never sought to "downplay" the known risks, which were constantly communicated in a variety of ways, including a "President's letter," issued beginning in **1949** to all employees.

When government regulators turned their attention to the beryllium industry, Brush Wellman withheld evidence that showed that workers could get sick from beryllium even when government safety limits were met.

Not true. The purpose of the **OSHA** hearing referred to here was to consider reducing the **2** ug/m3 standard as part **of** a generic cancer policy **OSHA** intended to establish. The "evidence" referred to is a report from a researcher associated with the Japanese company NGK Insulators, Ltd., of what he believed were five instances of CBD at exposures below 2 ug/m3. **A** delegation of NGK representatives came to the U.S. to discuss these cases and to learn as much as possible about the state of the art in controlling beryllium exposure. While here, at Brush's recommendation, NGK met with the four relevant government agencies **(OSHA,** NIOSH, **EPA,** AEC), the two leading medical institutions working on this issue (Massachusetts General Hospital and Cleveland Clinic) and representatives from

"This is shocking to me that they had this information," Dr. Peter Infante, director of standards review at the **U.S.** Occupational Safety and Health Administration, said when The Blade showed him documents that Brush had withheld regarding the safety limit.

A 22-month investigation by The Blade reveals a pattern of misleading statements by Brush Wellman officials spanning four decades and affecting thousands of workers.

Some Brush workers have been exposed year after year to unsafe levels of beryllium, a hard, gray metal that produces a toxic dust when cut, ground, or sanded. When inhaled, the dust often causes **an** incurable lung illness.

A total of 127 Brush workers have contracted the disease, with cases at plants in Ohio, Pennsylvania, Arizona, and Utah. In addition, more than 20 people who never worked for Brush, but who lived near **a** company plant in Lorain, O., were diagnosed in the 1940s and 1950s.

industry (from Brush, Kawecki Berylco Industries, National Beryllia and Coors Porcelain). No one NGK met with felt the information presented **was** reliable, specifically questioning the methodology NGK used and the understanding it had of the actual exposure conditions. First, there was evidence in the NGK data of acute disease, which require exposures well above the standard. Second, the air sampling protocol used was not typical of that used in the **U.S.,** and was believed to understate exposures.

Dr. Infante, at the time on loan to OSHA from **NIOSH,** was present at the OSHA hearing during the time that Dr. Howard Van Ordstrand of The Cleveland Clinic was testifying about his extensive experience studying Japanese beryllium workers. Dr. Infante's colleagues from both agencies who already knew about the NGK cases were in a perfect position to interrogate Dr. **Van** Ordstrand about the information in question, but they didn't.

In all, beryllium disease has contributed to the deaths of at least **32** Brush workers and neighbors since the 1940s, industry records and death certificates show.

"I look at it as willful manslaughter," says Theresa Norgard, wife of Dave Norgard, a Brush employee from Manitou Beach, Mich., who has the disease.

"Everyone knew about the dangers - except the workers."

Brush workers have always been thoroughly advised that beryllium is a hazardous material requiring safe handling to prevent health and environmental risks. As knowledge about beryllium has evolved, so too has the communication to our workers.

Brush Wellman, a publicly traded company with headquarters in Cleveland and facilities in five countries and 11 states, denies wrongdoing.

"I don't think we have tried in any way to obscure the facts," says Gordon Harnett, Brush's chairman of the board, president, **and** chief executive officer.

The Blade investigation was based on tens of thousands of court, industry, and recently declassified **U.S.** Government documents. Among the findings:

Four current or former Brush plants have repeatedly exposed workers to levels of beryllium dust above the federal safety limit. At all four, workers have developed beryllium disease.

See A Chronicle of Reckless Reporting , "The Fiction of Knowing Overexposure to Unsafe Conditions."

At the nearby Elmore plant, 50 workers have developed the disease. At least **39** of them worked in areas with documented exposures above the safety limit.

Again, see A Chronicle of Reckless Reporting, "The Fiction of Knowing Overexposure to Unsafe Conditions."

The company has concealed the true risks of beryllium from thousands of workers and customers, assuring them that accepted safety limits were protecting them, when it had evidence to the contrary.

This is flatly untrue. Brush did not have evidence to the contrary. The consensus of the medical-scientific community was that the standards developed by the AEC ***were*** protecting them.

Brush's warning labels, customer brochures, and instructional videos have considerably downplayed the risks of beryllium - one of the most toxic substances used in any workplace.

Brush has always conveyed the risks of beryllium **as** the company understood them at a given point in time and has either met or gone beyond standard practices for doing so.

One video compares the risks of working at Brush with hiking in the woods, where "there may be a few hidden hazards along the way," such **as** "snake bites, poison ivy, or twisting an ankle."

Dr. Lee Newman, a leading researcher on beryllium disease, described some **of** these warnings in a 1995 affidavit as "inadequate to warn even a sophisticated employer and its workers of the hazards."

In a 1996 deposition Dr. Newman admitted he was a clinician, had no training in warning labels or literature, had not examined Brush's warnings program but only documents furnished by plaintiff's attorneys **and** had conducted research under contracts funded by Brush and by its Beryllium Industry Advisory Committee, but had never expressed to either the company or to BISAC any reservations he might have had about the adequacy of its warnings.

Martin Powers, a retired Brush executive who for ***26*** years was largely responsible for what the company wrote and said about beryllium disease, says the firm never intentionally misled anyone.

But he acknowledges that some of its statements were "probably a little too dogmatic and definitive for the state of knowledge at the time."

For years, he says, Brush thought the disease had been virtually eliminated - "and maybe we talked that way."

But in the last 10 years, dozens of new cases have emerged.

This is the same 10 years which began with the emergence of the sophisticated new diagnostic techniques.

"It's been a big surprise and disappointment to me that we have lost ground in the past few years," says Mr. Powers, who remains a paid Brush consultant.

Brush officials stress that they always tell people what they know about the disease when they know it.

"Every year we try to update our level of knowledge and try to communicate with the employees where we are," Brush CEO Mr. Harnett says.

As for the high dust levels, Brush officials acknowledge that the firm has never consistently kept exposures under the federal safety limit in all parts of the plant. But workers, Mr. Powers says, know this.

The standard is extremely difficult to achieve in the best **of** circumstances (see Mr. Powers' comments next page). Despite that, the vast majority of tests conducted in modern times show that the success rate in achieving the standard has increased over time **as** technology and equipment have improved, but has always been on the high end. In fact, during the 1980s, the average test result for daily weighted averages at Elmore was below 1 ug/m3. By the late 1980s, **94** percent of test results were below **2** ug/m3 and in the early 1990s, **96** percent of the results were below 2.

Plant supervisors always post the results of dust counts on bulletin boards and discuss high exposures with employees, he says. And if high counts are discovered, workers are given respirators.

But Brush officials acknowledge that respirators don't always work, all employees don't understand dust counts, and by the time high exposures are discovered, workers have already been overexposed.

Mr. Powers says dust counts have remained high because it is technologically difficult to lower them. He notes that the federal limit, 2 micrograms of beryllium dust per cubic meter of air, is "a fantastically small quantity" - an amount invisible to the naked eye.

Historically, Brush could not simply shut operations that went over this limit, he says, because the **U.S.** Government needed beryllium, a material critical to the production of nuclear bombs and other weapons.

Besides, he says, Brush takes numerous precautions to protect workers, including quarterly medical exams and thousands of air samples a year.

"**I** think that Brush has done everything humanly possible to minimize the risk," Mr. Powers says.

Brush Medical Director Dr. David Deubner agrees, noting that Brush has invited researchers into its plants to study the illness.

"The company has a remarkable record about being open about this disease," Dr. Deubner says.

Others see it differently.

"They get it into your head that you don't have to worry about anything," says Dave Miller, a 39-year-old from Wayne, O., who contracted the disease at the Elmore plant.

"By the time you figure out they've hoodwinked you, it's **too** late."

See "Chronology of Events – Advancing Knowledge About and Preventing Chronic Beryllium Disease" for a complete summary of all that Brush has done proactively in this area.

The Company

FROM AN OLD STABLE TO INTERNATIONAL FIRM

Brush Wellman began 78 years ago in an old carriage house behind the Brush family estate in Cleveland.

Inside was Brush Laboratories, where in 1921 Charles Baldwin Sawyer and Bengt Kjellgren started experimenting with beryllium. Ten years later they founded Brush Beryllium with the financial help of Charles Brush II, son of the inventor of the arc light.

It was a small business: The two founders had only two employees. But the company grew steadily, receiving a huge boost in the 1940s with the start of World War II. The government bought hundreds of pounds of beryllium from Brush, using it to develop the bomb.

"You couldn't make a really good bomb without beryllium," recalls Mr. Powers, the former Brush executive.

Over the next four decades, throughout the Cold War and space race, the government was Brush's main customer, spending more than $1 billion for hundreds of tons of beryllium.

The government has been the main customer for the beryllium metal and beryllium oxide ceramics parts of Brush's business only. In modern times, the government's share never exceeded 30 percent of Brush's total business even at its peak and is only five percent of the business today.

Brush diversified in the 1970s, selling more beryllium-copper metal for use in computer and car parts. And it acquired the Abex Corp.'s S.K. Wellman division, a leading producer of clutch and brake parts. Hence, the name change: Brush Wellman.

When the Cold War ended, government orders nosedived. Today, only 5 per cent of Brush's business is defense-related,

Brush now emphasizes that its products help save lives. Beryllium is in tiny parts in pacemakers and air-bag systems, says Brush spokesman Timothy Reid, who recently left the firm.

"It really is one of these swords into plowshares things."

The Plants

WORKERS OVEREXPOSED IN SEVERAL FACILITIES

Brush's plants have never consistently kept beryllium dust under control.

In the 1940s, dust was so bad in the Lorain, ***O.,*** factory that workers at times couldn't see across the plant floor, company documents state.

But this was before the dangers **of** beryllium were fully understood and before rules on exposure existed.

Federal limits were set in 1949, but Brush's plants rarely met them. Throughout the 1950s, workers were routinely overexposed at facilities in Luckey, Cleveland, and Elmore, records show.

There were exposures about 2ug/m3, but exposures were steadily reduced with the implementation of control technologies, while at the same time fewer and fewer cases of **CBD** occurred.

At the Cleveland plant, some workers were exposed to levels **up *to*** 100 times the safety limit. In the neighborhood around the plant, dust samples reached five times the outdoor limit.

Airborne concentrations of beryllium in the 1940s ranged from 100 to 10,000 times higher than the levels typically experienced today. With the advent of scientific understanding **of** beryllium's impacts, exposures were reduced dramatically. The manufacturing operations which formerly were housed at the Cleveland plant later moved to Elmore; today the facility on St. Clair Avenue in Cleveland is Brush's corporate headquarters and R&D laboratory.

One government document from 1950 suggests that Brush owner Charles Sawyer knew about the dangers but had done little to reduce them:

"[Mr. Sawyer] has discussed this whole matter with one of the Brush Beryllium Company attorneys and he and they are in agreement that should negligence suits be brought against Brush in the future, the company would be in a very vulnerable position because it could be pointed out that evidence of overexposure was available and no direct action was taken to lower the exposures."

The Cleveland plant shut in 1963, and the Luckey factory closed in 1958. Some operations of both moved to Brush's plant just outside Elmore, 20 miles southeast of Toledo.

That plant was greatly expanded in 1957, when Brush built a facility to produce beryllium for the government.

At dedication ceremonies, company president Bengt Kjellgren proclaimed: "Many opportunities will await the graduates of the many public schools and universities in this area."

Among the locals who landed jobs: Gary Anderson and Butch Lemke, standouts on the Harris-Elmore High School football team.

As described in Chronology of Events – Advancing Knowledge About and Preventing Chronic Beryllium Disease, the actions that Mr. Sawyer took before this document was written have been described as "way ahead of its time."

It is not clear who authored the named government document, but the bias of the series comes out here when it attempts to ascribe negligence or less-than-lofty motives to Brush, based on this anonymous third-person excerpt of someone's opinion. See A Chronicle of Reckless Reporting, "An Early Commitment to Knowledge," for an eyewitness account of Brush's conduct from the beginning of the time when the need to combat overexposure to beryllium became clear. For more than 55 years, Brush has been proactive in reducing the risk of contracting CBD at its plants – through modifying workplace practices, educating employees and neighbors, investing in major capital improvements and sponsoring scientific research into the disease's causes.

Mr. Anderson worked at the Elmore plant for two years, starting as a summer student while attending the College **of** William and Mary in Virginia. One of his jobs: Cleaning out dusty ventilation hoods.

"To my recollection, they were only cleaned once a year, and that was done by summer students," he testified in his lawsuit against Brush.

Mr. Anderson was diagnosed with beryllium disease in 1975 and spent the final year of his life unable to breathe without the aid of an oxygen tank. He died in 1989 at age 48.

His widow, Patricia, dropped the lawsuit in **1993,** mainly because it became too emotionally draining for her, recalls her attorney, Bob Bryce.

"She got tired. How long can you relive your husband's death?"

Mr. Anderson's old teammate, Mr. Lemke, worked nine years at the Elmore plant. He was diagnosed with the disease in 1970 and has spent the past 15 years on oxygen.

Brush records recently disclosed in lawsuits show that both Mr. Anderson and Mr. Lemke worked in areas with dust levels over the safety limit.

Mr. Lemke says he never knew this: "**I** think that's terrible that they would allow something like that to go on and allow a person to work in something like that and not notify them that the air counts are that way."

The Workers

AMONG THE EMPLOYEES: 'DREGS OF SOCIETY'

In the 1940s, so many workers were getting sick at Brush that the company struggled to attract and keep new employees.

The only kind of workers Brush could get were "essentially the dregs of society," Mr. Powers, the former Brush executive, told company managers in 1986, according to a transcript of his talk.

This was during World War II, when adult males not in military service were in great demand and had their choice of jobs. That the Brush workers would work in an admittedly unpleasant foundry atmosphere is testimony to the limited, transient manpower available to Brush during those years.

Five Brush workers died **of** beryllium disease in the 1940s; dozens of'others had breathing problems; and 1 in 4 got rashes on their hands, arms, or faces.

Those with rashes were either laid off or advised by Brush doctors to quit, records show. The company was afraid they were allergic to beryllium and would develop the more serious lung disease.

This passage suggests that indeed Brush did have concern over workers' health since the early days and took steps to prevent them from getting CBD.

This policy caused tremendous turnover - "as high as 100 per cent per month," one report states.

Still, the illnesses were limited to workers. But in 1948 several residents near the Lorain plant were diagnosed with beryllium disease. Brush's insurance company canceled the firm's policy, and at least **26** lawsuits were filed.

The lawyer who represented some of the victims was a **3**1-year-old from Cleveland by the name of Howard Metzenbaum. All of the lawsuits were settled out of court, and the young lawyer went on to become a three-term **U.S.** senator from Ohio.

"I felt terribly bad for the people involved," the retired senator now recalls. "We felt [Brush] had not exercised due care and seen to it that their health was protected."

Throughout the '50s, '60s, and '70s, more and more Brush workers were diagnosed with beryllium disease.

But the company maintained that most had worked in the beryllium plants back in the '40s and '50s, when exposures to dust were extremely high.

Brush argued that of the workers hired after 1960, few had become sick. This proved that the disease was under control.

In fact, the consensus of the medical-scientific community in the early 1980s was that the disease had essentially been eliminated.

But it wasn't.

In the 1980s, 15 employees hired after 1960 were diagnosed with the disease, including two at Brush's Tucson, Ariz., plant, built in 1980 and thought to be safe.

Without question, identifying new cases at Tucson was a warning flag to Brush. With the advent of Blood Lymphocyte Proliferation Testing and fiber optic bronchoscopy soon thereafter, the company seized the opportunity to use these tools in further identifying and understanding CBD. Both continue to be used in ongoing research and medical surveillance at the company's facilities.

In all, 26 cases were diagnosed in the 1980s. In the 1990s, at least 46 more.

And the victims weren't just machinists.

They now included secretaries and administrators - employees with seemingly insignificant exposures.

The word "now" is misleading. Administrative and clerical workers were diagnosed with CBD in the 1940s and 1950s.

The Warnings

RISKS DOWNPLAYED IN LETTERS, VIDEOS

Hundreds of Brush workers were not adequately warned about beryllium disease when they were hired.

This is flatly untrue, as stated earlier. The consensus of the medical-scientific community was that the standards developed by the AEC ***were*** protecting them and Brush communicated that to workers.

For at least **28** years, from 1959 to 1986, new employees had to sign a letter from the company president that mentioned the illness and what the company thought the risks were.

The letter - virtually unchanged over three decades - states that beryllium can cause a respiratory disease of a "serious nature."

Nowhere does it say the disease is often fatal, that there is no cure, and that Brush workers have died.

The disease **is** not "often fatal" but is a sometimes-fatal illness. Furthermore, the letter from the president is just one part of **a** broad program of worker education on the subject of health risks. See **A** Chronicle of Reckless Reporting, "The Fiction of Withholding Evidence From Workers and Regulators.''

The letter further states that although there are risks, "our experience indicates that such hazards can be controlled." And Brush has the "most modern" equipment, "designed to control the beryllium content in the air you breathe within limits considered completely safe by competent medical authorities."

Nowhere does it say Brush has never consistently kept dust counts below those safety limits.

See **A** Chronicle of Reckless Reporting, "The Fiction of Knowing Overexposure to Unsafe Conditions."

Beryllium victim Butch Lemke signed one of those letters, back in 1959. He says the company's message to workers was unmistakable: "There's nothing to worry about. We have everything under control."

A reasonable person reviewing these letters at various points in time would see that Brush was not hiding the truth simply because the disease was not labeled as one that led to a fatal outcome. Between 1950 and 1985, the collective wisdom of the medical-scientific community was that the disease was largely under control.

That letter was replaced about 1990 with a more detailed one. But it still didn't tell new workers some basic information, such as beryllium disease is **an** incurable, often-fatal illness.

In January, 1998 - 55 years after beryllium dust was first discovered to be toxic - Brush started giving new workers a warning letter that stated that the disease could result in death.

Brush's Mr. Powers acknowledges that Brush's original warning letter was not entirely accurate, and he says he would rewrite part of it today.

This is another instance of taking a statement made out of context; the letter was accurate at the time it was written. We wouldn't use it today, and we're *not* using it today.

Brush officials stress that the warning letter is just one part of a large health and safety program, which includes safety meetings, on-the-job training, employee handouts, and video instructions.

But many of these materials, too, downplay the risks and withhold critical information.

One researcher who thinks Brush's warnings have misled workers is Dr. Lee Newman of the National Jewish Medical and Research Center in Denver.

Dr. Newman, who has treated numerous people with beryllium disease, reviewed many of Brush's warnings, labels, and statements and found them inaccurate and inadequate, according to his 1995 affidavit in **a** federal court case.

In that affidavit, Dr. Newman cited as inaccurate a Brush document stating that "the two microgram level appears to protect even the most hypersensitive person from the most toxic forms of beryllium." In the 1996 deposition taken from him following

his 1995 affidavit, he admitted that he had left out the first word in the sentence, which was "Thus." In doing so he had removed the reference to the preceding sentence, which was the premise upon which the second sentence was based. The two sentences in their entirety read: "On the other hand, there are no cases of illness on record where the exposures were at or less than the recommended industrial hygiene standard of an average of two micrograms of beryllium per cubic meter of air measured. Thus, the two microgram level appears to protect even the most hypersensitive person from the most toxic forms of beryllium." In a similar vein, he acknowledged in that same deposition – in contradiction to what he had stated in his affidavit – that the 2 ug/m3 exposure standard was indeed the OSHA standard at that time, that the consensus of the medical community was that this standard was protective, and that his statement of inadequacy was predicated upon the Japanese data that had been discounted by, among others, two leading medical institutions and four government agencies.

For example, a 1986 video says only 1 in 100 workers are susceptible to beryllium disease - a statement Brush repeated for years. At the time the video was made, Dr. Newman testified, the medical knowledge was that the rate was as high as 5 per cent, or 5 in 100.

Not true. The medical knowledge in 1986 was still based on a 1983 study by Merril Eisenbud and J. Lisson entitled "Epidemiological Aspects of Beryllium-Induced Nonmalignant Lung Disease: A 30-Year Update," published in the ***Journal of Occupational Medicine.*** As developed in that study, the data, which examined disease incidence by category of production process, calculated out to a rate of not more than 1 percent.

Today, Brush gives varying estimates of the percentage at risk, from 2 to 5 per cent.

Mr. Powers says that when he used the 1 in 100 number, he wasn't trying to mislead anyone. Rather, he was trying to point out that relatively few people are at risk for beryllium disease.

"And I don't think, frankly, that 1 in 100 or 5 in 100 is going to ease anybody's concern one way or the other."

The Risks

INFORMATION WITHHELD FROM WORKERS, REGULATORS

For years, Brush Wellman maintained that if dust counts were held under the safety limit, workers would not get sick.

The company told this to workers, customers, federal regulators, doctors, and the public.

But for at least 20 years, Brush had evidence that this might not be true.

And the company withheld it.

In fact, Brush repeatedly maintained it knew of no case of disease when exposures were kept under the safety limit.

Yet records **show** the company knew of such reports as early as **1974.**

That year, NGK Insulators, a beryllium firm in Japan, wrote to Brush Wellman to say that five Japanese workers had developed beryllium disease with exposures under the safety limit, which was the same in both countries: 2 micrograms of dust per cubic meter of air.

Dr. Shogo Shima, the Japanese firm's medical consultant, sent a similar letter to Brush medical consultant Dr. Howard VanOrdstrand.

"**This** is an extremely serious matter in considering what kind of measures should be taken to prevent this disease," the Japanese doctor wrote.

This was the understanding of scientists and physicians at the time.

This statement is not true. See A Chronicle of Reckless Reporting ,"The Fiction of Withholding Evidence from Workers **and** Regulators."

The Brush consultant wrote back, calling the finding "disturbing."

The next month, a Japanese delegation came to Cleveland to discuss the matter with Brush. While there, the Japanese doctor distributed copies of his study that had found the safety limit was not protecting workers.

But Brush did not share these findings with either its workers or customers.

As discussed previously, the reports had been discredited by four agencies; there was absolutely no reason that Brush would have shared such reports.

Three years later, in **1977,** Brush learned of another possible case of someone getting the disease at low exposure.

A Brush customer, Autonetics, a California firm, called Brush to report that it had "an established case of beryllium disease where the worker was never exposed to air levels greater than present limits," a Brush memo states. Top Brush executives, including Mr. Powers, were notified, as was company consultant Dr. VanOrdstrand.

The case was reviewed by The Cleveland Clinic's Dr. Howard Van Ordstrand, who felt no need to revise his view of the protective nature of the 2 ug/m3 standard after reviewing this customer report. A NIOSH investigation of Autonetics in 1981 found exposures above 2 ug/m3.

Just two months later, **OSHA** held public hearings on safety issues in the beryllium industry. The purpose: gather evidence on whether the exposure limit should be cut in half - from 2 micrograms to **1.**

When Brush officials testified, they said the existing limit clearly protected workers.

The company has "proven beyond a doubt" that the limit "is completely safe" in terms of preventing disease, Mr. Powers's written statement said.

He did not mention the customer or Japanese cases.

Again, based on the above discussion, there was absolutely no reason that this information would have been introduced into the hearing record. These cases had been discounted as unsound by all parties, public and private, to whom they had been presented during the NGK visit.

And Brush consultant Dr. VanOrdstrand testified that he knew of no cases of disease when dust counts were kept under the safety limit.

After the hearing, Brush Wellman submitted a final statement: "It is surely true that were there cases of the disease attributable to exposures below [the limit], they would long since have been recognized."

Here again, the credibility of the various reports had never been accepted by Brush or leading regulators and scientists.

In the end, the OSHA safety plan died.

But not because of any debate on the CBD issue.

OSHA's Dr. Peter Infante had questioned Brush officials at the public hearings in 1977, as a member of the National Institute for Occupational Safety and Health. He says that had Bmsh not withheld evidence, tougher limits might have been adopted.

See A Chronicle of Reckless Reporting, "The Fiction of Withholding Evidence from Workers and Regulators."

Because they weren't, he says, thousands of workers have been needlessly exposed to high levels of beryllium dust.

"These are people's lives. It's not, Oh gee, somebody lost a little bit of money.' They are dead, and there are other people who are suffocating to death."

Dr. Van Ordstrand, the Brush consultant who knew of reported illnesses under the safety limit, died in 1988.

Brush's Mr. Powers says he could not comment on the illness report from the Brush customer because he could not recall it.

As for the Japanese illnesses, he says Brush did not mention them to workers or regulators because it did not think those reports were credible.

Plus, Brush believed that government officials, including those at **OSHA,** already knew about the Japanese claims.

Brush ***knew*** that government officials knew about the Japanese claims. Remember, it was Brush that recommended that NGK meet with and present the findings in the first place.

That's because when the Japanese visited Brush in **1974,** they also visited several **U.S.** government agencies, according to an English translation of the Japanese trip report.

Among the officials they met with: OSHA's Robert Manware, who a year later would help coordinate OSHA's plan to reduce the safety limit.

Today, Mr. Manware says he does not recall meeting with the Japanese.

The translated notes of NGK's trip clearly list every person the company met with, and Robert Manware was just as clearly one of them.

OSHA's Dr. Infante says the Japanese visit never came to his attention, and nothing changes the fact that Brush withheld evidence of workers getting sick at low exposures.

Dr. Infante's responsibilities at that time did not lie in this specific domain; his role as a researcher was focused entirely on the cancer issue.

"They knew this stuff and they lied," he says.

See A Chronicle of Reckless Reporting, "The Fiction of Withholding Evidence from Workers and Regulators."

The Strategy

BRUSH'S LEGAL MANEUVER: PRESERVING THE LIMIT

Two more studies in the 1980s - one by British researchers and one by American scientists - reached the same conclusion reached by the Japanese: The safety limit was not protecting workers from beryllium disease.

But Brush continued to say that it was.

The limit is "100 per cent effective," a Brush executive told potential investors in 1986.

"Even the most sensitive person is safe," a 1988 customer brochure states.

For Brush, much was at stake: If it were accepted that the safety limit was not working, regulators might tighten the rules, requiring Brush to install expensive equipment to bring dust counts down.

Brush had been installing updated equipment all along, with the objective of reducing exposures to the lowest level reasonably achievable.

Plus, lawyers for beryllium victims could argue that Brush had said that the limit was protecting workers when it was not.

"Preserving the standard as it now exists is fundamental to our defense against product liability lawsuits," **a** Brush executive told the company's board **of** directors in 1990, according to records **of** that meeting.

This statement was made by Bob Rozek, Brush's Vice President of Administration at that time. It refers to the fact that the standard provided a basis for a legal defense where customers failed to comply with it and to protect their employees adequately, and this was the context in which the remark was made. None of this means that Brush would lie or hide knowledge regarding the standard, at that time or in the future.

The Japanese findings especially worried Brush. Three times between 1983 and 1991, Brush officials flew to Japan, in part, to talk to Dr. Shima about his findings.

During one trip, Brush lobbied Japanese beryllium business officials, warning that the findings could damage their markets and Brush's by scaring off customers and sparking tighter government controls.

By the late 1980s, more and more scientists were questioning the safety limit. Even the researcher who devised it in 1949, Merril Eisenbud, told Brush in 1989 that he could no longer defend it.

At this point, new cases of CBD were being discovered at **DOE** facilities.

Still, Brush continued to tell employees that the safety limit worked fine,

In 1991, Brush in-house attorney John Pallam wrote a statement for supervisors to use if workers asked whether the safety limit was protecting them.

The supervisors were to say the limit was protective, and Brush officials "have no reason to believe that it does not afford a safe workplace," Brush records show.

Today, Brush officials say they don't know if workers get ill at exposures under the limit. But they say there is no "credible" evidence that they do.

Meanwhile, the Energy Department, which uses beryllium in nuclear weapons, said in 1994 that the limit might not be protecting workers at its facilities.

It is now studying whether to lower the limit at government-owned plants.

OSHA's Dr. Infante says he would like **a** tougher limit, but his agency does not consider it a top priority now.

The Present

HIGH DUST LEVELS, FREQUENT EVACUATIONS

Beryllium dust levels, though improved over the past 20 years, remain a problem at the Elmore plant, Brush records show.

At least 11 plant operations, such as the scrap melting furnace and the analytical lab, have had exposures over the safety limit in the 1990s.

At times, dust in the plant gets so bad that a part of it must be evacuated. This usually occurs after a machine breaks down or an accident.

It is not unusual for the Elmore plant to have dozens of evacuations a year - sometimes more than one a day, records show.

There are several conditions under which an "evacuation" can occur. They are nearly always confined to a specific process area of the plant as opposed to being plant-wide. Typically a process upset leads to such an evacuation, after which process personnel wearing the appropriate personal protective equipment (PPE) will re-enter the area, restore the process to proper operation and decontaminate the area. Evacuations also occur if an air measurement exceeds the standard; in this scenario, the same procedure as above is followed. Finally, if an operation has a high risk of releasing respirable beryllium, the area in which that operation is performed is put under "silent evacuation," whereby operators with proper PPE perform the particular operation. After air samples indicate the risk has passed, an "all-clear" is sounded and the operators remove the PPE.

In fact, the **U.S.** Government has had "serious concerns" about the evacuations, saying they were disrupting production of beryllium for weapons, according to a 1989 report by a panel of the National Research Council, which advises the government on science and technology issues.

The author totally misconstrues National Materials Advisory Board Report-452 by taking this statement from the Executive Summary out of context. The discussions of evacuations relate primarily to the fluoride furnace area of the plant. The report notes in Chapter 3 that "Plant evacuations resulting from the malfunctioning of the ABF reduction [fluoride] furnaces still occur all too often, ***although their frequency has decreased as a result of the changes in operation."*** (emphasis ours) During the period this study covers, Brush invested nearly $10 million in capital improvements which contributed to the reduction in frequency of area evacuations. In later years, Brush invested **$4** million in a thermal decomposition process to improve the more conventional fluoride furnace referred to in the NMAB report. When this process proved unfruitful, Brush spent an additional **$4** million creating a restricted access zone and improving the ventilation system in this area of the plant. The report

stated, "Finally, the committee recommends as a first priority upgrading of the existing facility, which includes adding gas atomization and expanding NNS [near –net shape] fabrication capability." Brush spent nearly $12 million to install these additional capabilities.

Brush CEO Gordon Harnett says his company has worked hard in recent years to drive dust counts down.

"Frankly, I'm proud of our track record of protecting workers every way we can."

The Future

DISEASE IS OUT THERE, BUT WILL IT BE FOUND?

There are detectable amounts of beryllium dust at 14 Brush facilities, and the firm says it monitors the air at each one.

But Brush has tested workers for the disease at only four of those facilities. "We're concentrating our effort where we know we have serious problems," Brush Medical Director Dr. David Deubner says.

In the 1980s, Brush fought a government plan to test beryllium workers - even though Brush employees were not to be affected. The Energy Department proposed contacting former workers of government-owned sites to tell them that they may have been exposed to beryllium and that the government would provide free testing for the disease.

Brush attorney Randall Davis, in a letter to the Energy Department, argued that the program was unnecessary because beryllium workers - whether at Brush or at government plants - had already been warned while on the job. Re-establishing contact with these with people, he wrote, could lead to "widespread litigation" and "a modern day gold rush."

Major production facilities have been tested, along with the R&D laboratory at .Brush's Cleveland headquarters. The production facility in Reading, Pa., will be tested in **2000.**

Over Brush's objections, the government went ahead and notified former beryllium workers, and dozens of people with the disease or abnormal blood tests have been identified to date.

Brush employee and beryllium victim Dave Norgard says Brush should offer free tests to anyone who wants them. If the company did, he says, it would surely find more illness.

"Wherever they go they leave death and destruction."

Part 3: Workers misled

"Stonewalling:" Federal judge rules Brush concealed documents

BY SAM ROE
BLADE SENIOR WRITER

KNOXVILLE, Tenn. - When it comes to worker safety, Brush Wellman says it has nothing to hide.

But a federal court here in 1996 sanctioned the company for deliberately concealing potentially damaging documents about the dangers of beryllium. For this and related misconduct, Brush Wellman had to pay $175,000.

Brush engaged a Knoxville law firm when the company was named as a defendant in a suit brought by two ill workers from a Knoxville company to which Brush supplied copper beryllium. In the course of preparing her case, plaintiffs' attorney Ann Rowland, via the firm, requested voluminous amounts of documents from Brush. The attorney assigned to handle this, Stuart James, fell behind in responding to Rowland's requests and had not alerted anyone, including members of his own firm, to that fact or to the fact that a number of court orders had been issued compelling a response. When Brush Vice President and General Counsel John Pallam finally learned what was happening, the company took action right away, as did Mr. James' firm, which assigned more people to the job immediately. Brush established a central depository for documents (approximately three million pages) to make it easier for records to be accessed – despite the fact that no company is obliged to store records for the convenience of plaintiffs' counsel – and the original lawsuit went forward, ultimately being settled. It should be pointed out that there were no "potentially damaging documents" in the tens of thousands that were quickly produced by Brush. The federal court sanction occurred because no one was responding to the outstanding orders and the court didn't understand why that was. Once everyone involved did understand the situation, it was promptly corrected, and the malpractice claim brought by Brush against James and his former law firm was favorably settled to Brush's satisfaction.

"Brush Wellman's conduct has gone beyond gross negligence," **U.S.** Magistrate Judge Robert Murrian wrote in the case. The company's "deliberate indifference" and "intentional failure to produce documents...demonstrate a pattern of abuse that should be dealt with firmly."

Not true, since Brush did not know of the outstanding court orders (see above).

Lawyers for beryllium disease victims say the case further proves that Brush Wellman is hiding from the public what it knows about the dangers of beryllium and when it knew it.

The circumstances of this legal wrangle had nothing whatsoever to do with hiding information from the public.

"They withheld documents until they were caught," says Ann Rowland, the Tennessee attorney who won access to Brush's records.

Not true. Attorney James failed to produce until Brush learned of court orders outstanding and corrected the situation.

Brush Wellman would not comment, other than to say that one of its lawyers was to blame.

The penalty was among the largest of its kind in Tennessee. But the case is also noteworthy for what happened in the middle of the dispute, when Brush released some of its records.

Twelve boxes of documents were delivered to Brush's Cleveland law firm, Jones, Day, Reavis & Pogue. There, Ms. Rowland, who had been fighting for the records for months, began to review them in a conference room.

But she says she noticed the boxes were old and dusty. "I thought, Oh, my **God!** Is this beryllium?' "

Using baby wipes, she took dust samples of the boxes. She dropped each sample into a plastic bag and express-mailed them to a lab for analysis. When the results came back, she says, they revealed beryllium.

Furious, she got a court order for Brush to provide clean boxes. The company complied, and the records were delivered to a court reporter's office a few blocks from Brush's law firm.

This time, **Ms.** Rowland didn't take any chances: She says she returned to the records wearing protective clothing and **a** gas mask.

Brush's lawyers, she says, "just about croaked. They hate my guts."

Under the court sanction, Brush had to pay $175,000 to **Ms.** Rowland's Knoxville law firm, Rowland & Rowland, for the time she spent fighting for the records.

She originally had sued Brush in 1992 on behalf of two workers **who** developed beryllium disease after working at Robertshaw Controls, a Knoxville company. Brush was named a defendant, she says, because it supplied beryllium to the other firm.

As part of the lawsuit, Ms. Rowland asked that Brush turn over all pertinent records. Legally, Brush had to comply.

But it didn't, court records show, and the two sides spent the next year fighting the issue in court.

Numerous hearings were held, motions filed, and orders handed down. One hearing had no fewer than **17** lawyers present.

Brush also had the boxes tested, along with the newspaper box outside of the Jones, Day law firm, in downtown Cleveland, Ohio, and the levels were equivalent to those at which beryllium normally occurs in an urban environment,

"It looked like a bar convention," Chattanooga attorney Barry Gold recalls.

U.S. District Judge Leon Jordan ended another hearing by admonishing Brush: "This court will not put up with any stonewalling any longer."

But the problems continued.

Twice, the federal court ordered Brush to turn over its records, Twice, Brush violated the orders.

Finally, Magistrate Judge Murrian became fed up. In a strongly worded opinion, he said that although Brush had turned over 60,000 documents, whenever opponents "found a trail which might shed light on what Brush Wellman knew about" key issues, "they have run into a stone wall."

He was particularly upset over a critical document that he said Brush's in-house lawyer, John Pallam, deliberately concealed. He said Mr. Pallam not only. made "a bogus claim" that the record was exempt from disclosure, but he later tried to blame his secretary for the transgression.

Magistrate Judge Murrian concluded that he had no choice but to take a drastic step: **He** would recommend that Brush forfeit the entire lawsuit, leaving only the question of how much money the ill workers should get.

But Judge Jordan thought that penalty was too severe. He ruled that a $175,000 sanction was enough.

Contrary to this characterization, this issue was not a major point of contention in these proceedings, and there was no concealment of the document in question. No claim of attorney-client privilege was ever asserted, and the document was disclosed in this and other cases before the sanction charge was leveled.

In making this recommendation, Murrian assumed that Stuart James was taking his lead from Brush in being unresponsive when that was not true. James should have advised **us** what was going on but didn't; it was not willful obstruction of the process on Brush's part. **The recommendation of forfeit of the suit was dropped by the court once it understood that the company was uninformed.**

Mr. Pallam, Brush's in-house attorney who was found to have concealed a document, would not comment on the case.

In court filings, Brush maintained it was not concealing records. It blamed the Tennessee lawyer it hired to handle the case, Stuart James, for the problems.

Brush said Mr. James didn't inform the company of the seriousness of the problems; otherwise, all documents would have been released.

Mr. James says: "The **court** sanctioned Brush Wellman for its conduct and ended up not sanctioning me. **I** think that speaks louder than anything that Brush Wellman could say."

But the court did fault Mr. James: "He is to blame for many of the difficulties**...** ." He was referred to the court's chief judge for possible discipline but that judge said discipline was not warranted.

Meanwhile, the lawsuit that started the whole document dispute was settled out of court, with Brush giving the two ill workers an undisclosed amount of money. Ms. Rowland, their attorney, would only say that "it was a lot."

Not true. See above.

Part 3: Workers misled

Brush lawyers accused of knowing about fraud

Legal giant Jones Day calls allegation "nonsense"

BY *SAM* ROE
BLADE SENIOR WRITER

For more than a half-century, Brush Wellman has battled its health problems with the help of one of the largest and most prestigious law firms in the nation: Jones, Day, Reavis & Pogue.

Jones Day has helped the beryllium company fight worker lawsuits and fend off **U.S.** safety regulators.

Now, Jones Day attorneys are at the center of a serious allegation: **A** Colorado lawyer has accused Brush Wellman of using the attorneys to conceal the true dangers **of** beryllium.

In a court motion filed in October, James Heckbert, an attorney for about 50 beryllium disease victims in Colorado and Arizona, alleges "that for approximately **40** years Brush Wellman has been using its attorneys to facilitate a fraud regarding the safety of beryllium."

Brush's attorneys, the motion states, "have been aware of this ongoing fraudulent scheme."

Mr. Heckbert alleges that Brush Wellman, through its attorneys, hid from the public and federal regulators evidence that the federal safety limit for beryllium dust was not protecting workers.

Like every other company in the world, Brush does retain a law firm to represent its interests in litigation of all kinds, not just workplace safety issues.

Among the attorneys allegedly involved: Brush's in-house lawyer John Pallam and three outside attorneys from Jones Day, including Patrick McCartan.

Mr. McCartan is Jones Day's managing partner, the equivalent of a chief executive officer.

He declined to be interviewed, saying he does not comment on client matters. "I will say that any allegations of fraud are nonsense."

Mr. Pallam, Brush's in-house lawyer, declined several requests for interviews.

In court records, Brush Wellman calls Mr. Heckbert's allegation a "preposterous theory" with no basis.

Brush produces beryllium, a rare metal that can cause a lung disease when its dust is inhaled. The company is based in Cleveland, as is Jones Day. Since the 1940s, Brush has sought advice from the legal firm.

In the legal world, Jones Day is a giant: It has 1,100 attorneys in 10 American and 10 overseas offices, including London, Hong Kong, and New Delhi.

It has represented many high-profile clients, including **R.J.** Reynolds Tobacco Co. **and** financier Charles Keating, Jr.

The recent accusation against Jones Day was filed in a worker's lawsuit in **U.S.** District Court in Arizona.

A former electrician is suing Brush Wellman, claiming he contracted beryllium disease at the company's Tucson plant. His attorney, Mr. Heckbert, claims Brush has been withholding records in the case; Brush says the records are exempt from disclosure because of attorney-client privilege.

In October, Mr. Heckbert filed a motion in an attempt to pierce the attorney-client privilege.

He cited a long-standing rule of law: Attorney-client privilege does not protect communications between a client and attorney made in furtherance of a crime or fraud.

According to Mr. Heckbert's claim:

Brush knew for years, but did not disclose, that workers would develop beryllium disease at exposures under the safety limit.

In **1974,** Brush learned that a Japanese beryllium firm was reporting disease at levels under the limit; in **1977,** a Brush customer, Autonetics, reported such a case to Brush.

Brush sent information about the customer case to Mr. McCartan, the Jones Day attorney. **A** few weeks later, in August, **1977,** he represented the beryllium company at hearings before the **U.S.** Occupational Safety and Health Administration.

At the hearings, two Brush officials submitted statements saying the safety limit prevented disease.

Brush's response to this information was to evaluate it and encourage the Japanese firm to share it with **U.S.** authorities, which was done, as discussed in detail in **Part** 3, Article 1.

After the hearings, Brush submitted a final statement: "It is surely true that were there cases of the disease attributable to exposures below [the limit], they would long since have been recognized."

This statement was submitted by a Brush official and two Jones Day attorneys, including Mr. McCartan.

Mr. Heckbert's motion goes beyond allegations against Jones Day attorneys.

In 1991, the motion states, Brush instructed its in-house lawyer, Mr. Pallam, to draft a response to workers who might ask whether the safety limit protected them. Mr. Pallam did so, asserting the limit was protective.

Brush disputes Mr. Heckbert's allegations.

In court records, the company says it did not conceal evidence from regulators nor misrepresent the risks of beryllium to others.

The company says that at the time it made certain statements, "the weight of scientific and medical opinion" was that the safety limit was protective.

Brush has asked the Arizona court to reject Mr. Heckbert's request for attorney-client records.

The court has yet to make a ruling.

PART 4

THOUGHT CONTROL

Part 4: Thought control

Brush devised strategy to shape knowledge

BY SAM ROE
BLADE SENIOR WRITER

A dozen years ago, Brush Wellman and its amazing metal, beryllium, were under increasing attack.

More and more workers were getting beryllium disease, customers were being scared off, and scientists were saying the metal **was** more dangerous than previously thought.

Brush decided to fight back - and not with simple public relations.

The company, industry documents show, systematically and aggressively set out to influence the scientific knowledge of the hazards of beryllium.

The company aggressively led the way in encouraging and investing in medical surveillance of its workforce and independent medical research into the prevention and treatment of CBD.

It created a national committee of doctors and scientists to "promote research" - a group handpicked, organized, and primarily funded by Brush.

The Beryllium Industry Scientific Advisory Committee (BISAC) is comprised of highly reputable scientists with stature in their fields. Their mission is to identify priorities for research and to provide seed money to facilitate such research. Its efforts to date are responsible for federally-funded, independent research being conducted on the causes of CBD and on possible genetic aspects of the disease.

It published its own textbook on beryllium, distributing the book to medical schools across the country.

It helped establish a Washington-based industry group to promote beryllium products and to attack damaging scientific studies.

Indeed, Brush's actions offer a rare glimpse at what a corporation facing mounting medical and public relations problems will do to protect its product.

Communications between Brush and every one of the groups affected by health issues – employees, customers, neighbors, the medical community, government agencies at all levels, stockholders, the media and the general public – has been a cornerstone of the company's health and safety program since the first evidence of beryllium's health effects emerged in **1943.** The Chronology of Events attached to this document clearly illustrates that for more than 55 years, Brush has been in the forefront of every major effort to identify and eliminate the hazards of beryllium exposure. "Product stewardship" is a relatively modem term for a long-standing Brush policy of sharing knowledge and experience on a timely and thorough basis with all concerned parties. This includes, when necessary, correcting previously-held positions when new evidence dictates such corrections **as** well as vigorously defending our position against mischievous and deliberate distortions of the truth **as** in the case of the 1977 **OSHA** hearing and the current ***Blade*** series.

In this case, Brush devised a detailed, year-by-year strategy to take greater control of how scientists, doctors, students, **and** the public viewed beryllium.

This included spending more than **$1** million on its science group and pushing for medical papers to discredit research that had found beryllium extremely hazardous, company records disclosed in recent lawsuits show.

The $1 million has been contributed directly to researchers identified by BISAC who were in a position to further the body of knowledge about the causes and prevention of **CBD.** BISAC itself has not been the recipient of these monies other than for the fees and expenses **of** its members.

Brush's actions have far-reaching effects, in part, because the Cleveland-based company is America's leading producer of beryllium, an extremely hard, lightweight metal used to make everything from nuclear weapons to space probes to golf clubs.

So thousands of workers, customers, and doctors rely on Brush for accurate health and safety information.

Some victim advocates say Brush has been less than honest.

"They pervert science and injure people," says Theresa Norgard, a social research associate at the University of Michigan whose husband, Dave, contracted beryllium disease at Brush's plant outside Elmore, 20 miles southeast of Toledo.

Peter Infante, a senior administrator with the **U.S.** Occupational Safety and Health Administration, says Brush's textbook is clearly "propaganda." **But he adds that the company can't control the knowledge of the disease because too many scientists are studying the issue.**

Beryllium disease is **a** chronic lung ailment caused by inhaling microscopic bits of beryllium dust. Researchers estimate that 1,200 Americans have contracted the disease, which is often fatal and has no cure. At Brush Wellman, 127 workers have developed the disease - 50 at the Elmore plant.

A former Brush executive says the company's actions in the late 1980s weren't designed to deceive anyone or hide anything.

And we have always shared what we know when we know it with all of our key constituencies.

Dr. Infante's comments ignore the fact that Brush Wellman has led the way in the study of CBD and in encouraging scientists to examine the problem. The book is also, as ***The Blade*** points out later, used by America's top medical schools, which speaks to its quality as a textbook.

"They were meant to do the same thing we've always done: try to find out what the hell is going on and tell people what we know, when we know it," says Martin Powers, who helped devise the company's strategy to improve beryllium's image.

The strategy emerged in 1986, when Brush faced an increase in disease, customer concerns, and damaging scientific studies.

Our industry was suddenly faced with a perplexing challenge: namely, that new cases of CBD, a disease previously thought to be largely eliminated by the adoption of permissible exposure standards 45 years prior, were being diagnosed.

Top Brush officials, company records show, met for two days at a Cleveland-area hotel to devise a strategy "to protect the company from adverse medical, legal, public relations or legislative consequences."

Which.is what any publicly-held company responsible to its shareholders would do.

Their conclusion: Brush must expand safety programs and worker training.

But they also proposed a massive plan to combat scientific studies that had found beryllium was extremely hazardous - studies Brush thought were inaccurate and "very damaging."

"These actions should be systematically approached over the next two years," one Brush document says.

"The ultimate consequences to the company's future of not going forward with this program could be severe," another says.

The company proposed writing its own textbook and several medical papers. One company document names which Brush officials should write the papers, where they should be published - even what they should be titled.

Brush officials were among the most knowledgeable people in the country on the subject, and they were willing to share that knowledge.

One paper was to attack the links between beryllium and lung cancer.

Labeling a substance a human carcinogen before there is general agreement on this point is a serious step. The three then-existing epidemiological studies of beryllium workers were, in the estimation of many experts, marred by serious methodological problems that prevented drawing conclusions based on sound science. Brush did what any company would do when its product was being linked prematurely with something as serious as lung cancer.

"Preferably," a Brush document states, "the primary authors should be Drs. MacMahon and Roth," two company consultants. "However, most of the work on this paper would have to be done by Brush Wellman."

Dr. MacMahon was an internationally-recognized cancer epidemiologist. Dr. Roth, formerly a biostatistician at EPA, now runs his own consulting firm. They were renowned experts in their fields and implying that it besmirches their credentials to identify them as Brush consultants doesn't change that.

And Brush wanted all of these papers written quickly, and so they could be used as references for its textbook.

The textbook was published in 1991 and titled Beryllium: Biomedical and Environmental Aspects. Brush paid for it and sent copies to hundreds of medical schools, businesses, and libraries across the country.

It's on the shelves of many of America's top medical schools, such as Harvard Medical School and the Washington University School of Medicine in St. Louis, as well as at the Centers for Disease Control and Prevention in Atlanta.

Which speaks to its quality as a textbook.

Locally, it's at the Medical College of Ohio, the University of Toledo, and the Toledo-Lucas County Public Library.

It is edited by two former Brush officials and a Pennsylvania physician who has received research money from the beryllium industry. Many chapters were written by Brush's executives, doctors, and lawyers.

"What that book is the company line," says James Heckbert, a Colorado attorney for about 50 workers with beryllium disease who are suing Brush.

The chapter on beryllium's health risks is written by Dr. Otto Preuss, a former Brush medical director and one of the book's editors. He states a long-held position of the company: No worker has ever gotten sick when exposed to levels of beryllium dust below the federal safety limit.

He states this as fact, discounting studies that have found otherwise. Dr. Preuss does not elaborate, but a footnote gives the source for why these studies should be discounted: His own letter to the editor of the British Journal of Industrial Medicine.

Mr. Powers, the former Brush official and one of the textbooks editors, says the book is fair.

But he acknowledges that there are "some statements in there that I think are too dogmatic" - opinions, he says, that are stated as facts.

In addition to the book, Brush has:

Arranged graduate-level seminars at universities. One Brush document states: "We need to actively educate the university professors on our materials and health issues in order to train the next generation of engineers on the truths and myths about beryllium-containing materials."

Rightly so, since they are the experts in the field.

Reaching out to future engineers is part of Brush's product stewardship program. We would be remiss if we *didn't* do this sort of thing.

Helped create the Beryllia Ceramic Development Association, an industry group in Washington. Brush says it was formed, in part, "to combat erroneous health and safety information being disseminated" about beryllium products.

Any company, believing that a campaign exists to bash its product, would do the same thing. We simply did what we felt was necessary to ensure that a balanced view of beryllium was taken in all forums where it was being discussed.

Helped establish the Beryllium Industry Scientific Advisory Committee, consisting of Brush's company doctor and several scientists from noted universities, such as Harvard.

The science group is particularly controversial.

It is funded entirely by the beryllium industry, with Brush picking up most of the costs. Records show that Brush has contributed more than $1 million to the group since it was formed in 1990.

Other than paying the salary and expenses of the group's executive director, and the periodic expenses of its members, all of the monies contributed by Brush are passed through to researchers. Funding research is the mission of **BISAC.**

Mr. Powers, the group's executive director, has received more than $230,000 for his time and expenses.

He says he and a Brush consultant picked the original members. Since then, the group has picked its own members. The group meets a couple of times a year, and members are paid $2,000 a day, plus travel expenses.

The Brush consultant was Merril Eisenbud, the man who was director of the AEC's Health and Safety Laboratory from 1947 to 1957, and was essentially one of the world's leading authorities on beryllium well into the '90s.

Mr. Powers says the group was created to finance worthwhile research. One current study is trying to determine whether there is a genetic predisposition for getting beryllium disease.

Still, others see the science group differently.

The "others" cited by ***The BZade*** consist of one attorney currently suing Brush Wellman.

"It's an industry-funded group of doctors who are hired to provide specific information that the companies can use for ammunition for public relations," says Mr. Heckbert, the attorney for the beryllium victims.

Again, these are individuals are the nation's very best scientists and medical professionals dealing with CBD. All of them have superb credentials, detailed below, and a history of excellent and objective research. Furthermore not one shred of evidence is presented here that this group is ***not*** objective in its appraisal of what its charge is. Following is a list of all BISAC members, past and present, their credentials and their contributions to beryllium health issues:

Merril Eisenbud – The initial Chairman of BISAC and generally recognized as the foremost scientist on the subject of beryllium health issues. He headed the AEC investigative team that set the three still existing standards for beryllium exposure, was Manager of the AEC's New York Operations Office, Professor of Occupational Health at New York University, Head of the New York Environmental Protection program under Mayor John Lindsey, and Chairman of Equitable Environmental Health, a consulting firm.

Paul Kotin – The current BISAC Chairman. Formerly, Senior Vice President and Medical Director of Johns Manville Corp., first Director of the National Institute of Environmental Health Services, Asst. Director of the Cancer Institute, Dean of the School of Medicine at Temple University and a long time consultant to organized labor, industry and government. Dr. Kotin is considered to be one of the foremost pathologists in the world.

Brian MacMahon – When Dr. Joseph Wagoner, author of the discredited beryllium epidemiology studies, was asked in the OSHA hearings to describe "epidemiology" he responded by saying "Brian MacMahon defines it ...". Now

retired, Dr. MacMahon was the head of the Harvard School of Public Health and one of the world's leading authorities on epidemiology. When asked to review the Wagoner and Infante studies for the beryllium industry and testify at the OSHA hearing in 1977, he agreed on the condition that there would be no prior consultation and the industry would support his analysis, whether favorable to the company or not. The industry agreed. He was one of the eight scientists who wrote the open letter to the Secretary of Health, Education and Welfare condemning the Wagoner-Infante studies as fraudulent science.

Frederick Miller – Shortly after the establishment of BISAC it became apparent that the importance **of** genetic factors on the occurrence of CBD would dictate the presence on BISAC of an immunologist. The Committee decided that the foremost candidate was Dr. Miller, head of the Pathology Department at New York University at Stoney Brook. At the Beryllium Symposium sponsored jointly by the DOE and the beryllium industry in Washington, D.C. in February, 1992, Dr. Miller was selected to head the joint task force of researchers and laboratories chosen to develop standardized procedures for all Blood Lymphocyte Proliferation Testing and Broncho-Alveolar Lavage and related biopsy procedures for all laboratories and hospitals, government and private.

Adrianne Rogers – Dr. Rogers was selected by the beryllium industry to do **a** comprehensive study of all experimental animal research on beryllium for the 1977 OSHA hearings, based upon her extensive research work at Massachusetts Institute of Technology. She has continued to follow the experimental animal research on beryllium as an industry consultant, A

graduate of Radcliffe College and Harvard Medical School, Dr. Rogers currently directs the Ph.D. program in pathology at Boston University School of Medicine in addition to her clinical and research responsibilities as Professor, Associate Chair **of** Pathology, Boston U. School **of** Medicine and Associate Pathologist, Mallory Institute of Pathology, Boston City Hospital.

Dimitrios Trichopoulos – Dr. Trichopoulos succeeded Brian MacMahon as head of the Epidemiology Department, Harvard School of Health, when Dr. MacMahon retired and also agreed to replace Dr. MacMahon as the epidemiologist on BISAC, despite his worldwide responsibilities as member or consultant to a wide variety of international scientific organizations and his commitment to serve in absentia as Professor of Epidemiology at the University of Athens Medical School in Athens, Greece. Dr. Trichopoulos is a Greek citizen.

Thomas Markham – Dr. Markham was Corporate Medical Director of Brush Wellman and served **as** liaison between the industry and BISAC. He served as a Medical Officer in the **U.S.** Navy for **23** years, including assignments as Senior Medical Officer at the Mare Island Naval Shipyard, Director of Occupational Environmental Medicine for Oakland Naval Hospital, Commanding Officer of the Navy Environmental Health Center (OSHA), Director of Safety and Fire Protection for the Naval Material Command and Chief of Occupational Medicine at the Uniform Services University **of** the Health Sciences School of Medicine.

James Lockey – Dr. Lockey is a recent addition to BISAC, providing a wealth of occupational health experience. He is currently serving **as** Professor of Environmental Health at University of Cincinnati College of Medicine. Dr. Lockey has been valuable in assisting the current Corporate Medical Director of Brush in carrying out a joint agreement between NIOSH and Brush to conduct joint research in Brush Wellman facilities on epidemiological and occupational aspects of CBD.

Industry documents turned over in recent court cases show that the group is not just interested in science.

Its charter says its purpose is, in part, to "develop and implement a strategy to address...the perception of beryllium **as** a human carcinogen."

Brush has long fought the notion that beryllium causes cancer, and one company document states that the science group "will provide the scientific basis for our cancer strategy."

At a meeting in 1992, the science group discussed **how** cancer was not just a medical issue but a "public relations and marketing problem" as well, according to minutes of the meeting.

The scientists wanted a lawyer "familiar with these kind of broad strategy considerations," so they asked Brush attorney John Newman to address the group.

He did, warning the scientists that "if beryllium is perceived as causing lung cancer, regardless how scientifically unsound that perception may be, lawsuits alleging cancer will ensue."

The Brush attorney then advised the scientists how best to deal with that threat.

A few months later, in **1993,** the International Agency for Research on Cancer, an arm of the World Health Organization, was deciding whether to classify beryllium as a human carcinogen. The beryllium science group sent member Dr. Paul Kotin to the meeting in Lyon, France, to argue that the metal did not cause cancer, industry records indicate.

But the cancer organization still ruled that beryllium was a human carcinogen.

Dr. Kotin is now chairman of the beryllium science group. The 82-year-old retired cancer researcher says his visit to France had "an element of industry advocacy."

But he says he did not go to misinform anybody; rather, he wanted to present the industry's data so others could make informed decisions.

Dr. Kotin has never published a paper on beryllium, but he has had nearly 50 years' experience in environmental health. He has taught medicine at several universities and was a senior officer at Johns-Manville Corp. in the **1970s** when the asbestos-maker was facing scores of civil suits over asbestos-related disorders and death.

He says the beryllium science **group** is honest and worthwhile.

"I have been on advisory committees for many, many industries and many, many unions. This is as good as I've ever been on."

Part 4: Thought control

Firm rewrote its role in Lorain tragedy

BY *SAM* ROE
BLADE SENIOR WRITER

LORAIN, O. - It was one of the most mysterious public health cases in Ohio history: Fifty-one years ago, several residents here were dying from beryllium disease even though they had never set foot in the local beryllium plant.

Federal and state health officials investigated, sampling the city's air for weeks and X-raying 10,000 residents - a fifth of the entire town.

The researchers' conclusion: Air pollution from the beryllium plant had caused beryllium disease in at least 10 people.

That was **1948.**

Since then, the plant's owner, Brush Wellman Inc., has spread a much different version of events.

It has said air pollution from its plant didn't harm all of those people; rather, workers going home in dust-covered clothing were mostly to blame.

This information came to light, a Brush doctor once told an international conference, "after much painstaking, detective-style investigation."

Or did it?

A Blade investigation suggests this is one of several examples of Brush Wellman rewriting history without the facts to back it up.

It is not anything of the sort, as we will go on to explain in the ensuing pages.

U.S. government and industry records show that Brush has repeatedly made misleading or unsupportable statements about past events relating to the dangers of beryllium.

At times, these statements were made to federal regulators or international scientists trying to stop beryllium disease.

In the Lorain tragedy, Brush officials cannot produce any evidence supporting their claim that air pollution didn't poison those **10** residents.

They have no study, no government report, and no retraction from the scientists **who** did the original investigation.

In fact, the **U.S.** government scientist who led the inquiry 51 years ago, Merril Eisenbud, criticized Brush's version of the tragedy shortly before he died in 1997.

"**I** think it's a very poor quality reporting of the facts **....** I'm just trying to put it kindly," Mr. Eisenbud, the former health director of the **U.S.** Atomic Energy Commission, testified in a court deposition.

His study in **1948** found 11 victims in the Lorain neighborhood **- 10** who had contracted the disease solely because of air pollution; another case was attributed to handling dusty work clothes.

The number of recognized neighborhood cases would eventually exceed 20, with researchers attributing some illnesses to air pollution and some to contaminated clothing.

Patently untrue. Brush has not made misleading or insupportable statements on matters pertaining to beryllium repeatedly – or ever.

But Brush Wellman continued to say air pollution was not to blame.

Only Merril Eisenbud claimed that low-level air pollution had caused the so-called neighborhood cases. There is no evidence that Eisenbud thoroughly investigated the possibility of contact exposures, or dust exposures from sources ***other*** than air pollution, in all of the Lorain cases. **Dr. DeNardi, a Lorain physician who saw these patients, did investigate this and reported to Martin Powers that 17 of the 20 cases were contact cases.** Moreover, Brush was not alone in concluding that low-level air pollution was not the cause of these cases. In 1967, the **U.S.** Department of Health, Education and Welfare sponsored a symposium on beryllium; the summary of this event reported that most of the neighborhood cases, when carefully evaluated, show evidence of rather close contact either with a beryllium worker or with a worker's clothes or of time spent close to one of the plants. In **1972,** NIOSH's Criterion Document for Beryllium took an even stronger position, asserting that "in nearly every instance of a reported neighborhood case, close examination of the circumstances indicates exposure to be caused or contributed to by means other than ambient air pollution **...** It has yet to be definitely established whether ambient contamination alone, at a distance from a plant, can cause chronic beryllium disease." There is also scientific literature, by authors independent of Brush, concluding that neighborhood cases in Pennsylvania could not be attributed only to air pollution (Lieben et al.) ***So*** Brush was not "re-writing history," but simply expressing disagreement with the early conclusions of Merril Eisenbud – a disagreement shared with other scientists and government agencies.

For Brush, there is a motivation to dispel the belief that air pollution from its brain plant had caused beryllium disease, company records indicate.

One Brush document, stamped "company confidential" but recently disclosed in an Arizona court case, states that if the company could get the government to reverse its position that pollution had harmed citizens, "we might be able to eliminate beryllium as an air pollutant (from the official list of pollutants)."

And that would mean Brush would no longer be required to maintain expensive pollution controls.

In addition, the brain residents were found to have gotten sick at exposure levels far below what is currently considered safe for workers inside beryllium plants - a finding that has serious safety and legal implications.

Brush Wellman denies it has ever tried to deceive anyone or rewrite history to suit its needs.

Martin Powers, a former Brush executive who for 26 years was largely responsible for what the firm publicly said about beryllium disease, acknowledges that some Brush officials have claimed air pollution was not a major factor in the Lorain illnesses.

But he says they were expressing their personal opinions, not speaking for the company.

"We at Brush have never officially taken a position one way or the other" regarding whether pollution from the plant hurt residents, says Mr. Powers, now a Brush consultant.

But that is not the truth.

In 1969, Mr. Powers himself wrote to the Consumer Protection and Environmental Health Service, an office of what was then the **U.S.** Department of Health, Education and Welfare, saying air pollution was not to blame for the Lorain tragedy. Rather, he told the agency, all of the citizens who contracted beryllium disease got it from washing contaminated clothes or other direct contact with the metal.

This statement, Mr. Powers wrote, was "the fundamental philosophy of our company" on the issue.

In addition, Brush Wellman in **1967** sent formal statements, signed by Mr. Powers, to Pennsylvania and New York state regulators saying that the notion that pollution caused the illnesses "was an erroneous one."

And when Brush was fighting against tougher federal safety standards in the 1970s, it told **U.S.** regulators in **a** report that "virtually" all of the community cases had been traced to causes other than air pollution.

That position was based on what Brush once called a "detective-style investigation." The person who used those words was former Brush Medical Director Dr. Otto Preuss.

But in a recent deposition, he acknowledges he has never investigated the Lorain illnesses, has never interviewed the victims, and has no evidence that disproves the original **U.S.** government study.

Dr. Preuss is now retired and living in Arizona. Through a Brush spokesman, he declined to comment.

The old b r a i n plant, on 1st Street on the banks of Lake Erie, closed in 1948 and was later torn down. The spot is now a parking lot for the municipal fishing pier.

One person upset with Brush's version of the tragedy: Joseph Gorka. His 7-year-old daughter, Gloria, died of beryllium disease in 1948, researchers concluded.

Mr. Gorka says she was never exposed to beryllium other than from air pollution, and Brush officials have never interviewed him about her death.

"They have never wrote, called or anything," says Mr. Gorka, now 81 and living in Florida.

Stanley Sobocienski's relatives dso dispute Brush's story. He died in 1946 at age **34,** but doctors didn't blame beryllium because he had never worked in the plant. But when other people living near the plant became ill, researchers in 1948 reopened his case and concluded he had died of beryllium disease from the plant's air pollution.

His widow, Leda Denka, says he never knew why he was so sick. "**He** just thought he had a bad cold and cough and couldn't get rid of it," says **Ms.** Denka, **87,** of Amherst, **O.**

Mr. Sobocienski's daughter, Cheryl Sanders, was 5 when he died. She now has only two images of her father: Him sick in bed, and the funeral in her aunt's home.

"I remember him laying in the casket," recalls Ms. Sanders, 57, of Amherst, "and I remember crying, and they would take me into the kitchen and calm me down and tell me that he was with God now."

Her brother, Stanley Jr., was 11 at the time. He remembers his father as a large, vibrant man who dropped to under 100 pounds. When he died, little Stanley's aunt came to school to break the news.

"I thought he would live for a while longer or get healthier, one or the other, you know?" recalls Stanley, Jr., now 63 and running the Bering Sea Saloon in Nome, Alaska.

There are other examples of Brush Wellman rewriting history.

Throughout the 1970s and 1980s, Brush argued that it had beryllium disease under control and that there was no need for tighter regulations.

As proof, the firm said that among its recent hires, only two had contracted the disease, and both cases could be traced to accidents, They were "definitely preventable" accidents that "were obviously the result of human error," the company told federal regulators in 1977.

But Brush officials now acknowledge in interviews that they don't know for sure how these workers - or any others - contracted the disease.

In fact, they acknowledge it is impossible to know with certainty.

That's because no one knows how much beryllium dust constitutes a toxic exposure. Even if someone did, Brush does not monitor the air quality of every worker, every day.

So when workers are diagnosed with beryllium disease - often years after they have left the plant - it is impossible to precisely recreate their exposures and, therefore, impossible to trace their illnesses to specific events.

Mr. Powers, the Brush consultant, says the company's claim that it had traced cases of disease to accidents was based on "reasonable assumptions."

But **he** acknowledges "it is a dogmatic statement that can't be proved."

"**And** I would apologize for it now, but at that time we honestly believed that was the situation. We should have been more careful."

Brush has said that the historic X-ray program in Lorain to look for disease was the product of a "cooperative" effort between Brush and the government.

But in truth, Brush was against the survey and tried to persuade the government not to do it.

Again, patently untrue. Merril Eisenbud provides a much different account in his autobiography, An Environmental Odyssey, 53 (1990): "It fell on me to call on the chairman of the Lorain company to inform him of our findings. It was an emotional interview, in which a sensitive executive was faced with what may have been the first time an industrial company was responsible for a chronic and fatal lung disease among persons living near one of its plants. **He understood immediately that it was necessary to determine how many cases existed in the community and asked how this could be done.** When I suggested that there should be a mass **X**-ray of the residents, he requested that I make the arrangements for him. Accordingly, Bernard Wolf and I visited the Ohio Commissioner of Health to explain the situation to him and to request that such a survey be undertaken by his department. About six thousand residents were X-rayed in June 1948."

Records show that Brush executives had a meeting to discuss the survey with their attorneys, insurance company, and medical consultant.

One possibility raised at the meeting: X-raying the residents under the guise of a tuberculosis survey.

But Ohio State Health Director John Porterfield, who attended the meeting, rejected that notion.

In the end, the Brush group concluded that an X-ray survey would cause more harm than good.

This was ***not*** the conclusion that Brush came to.

They thought "all it would do would be to uncover such cases as might now exist and also might increase the number of claims that might be made against the insurance company...," then-Brush President Francis Sherwin wrote to the Atomic Energy Commission.

But he said Brush would cooperate if that's what the government wanted.

That's what it wanted.

Eisenbud's statements clearly show that Sherwin's position was not the corporate position.

Past 4: Thought control

Brush gives victims the option to "volunteer"

BY *SAM* ROE
BLADE SENIOR WRITER

Two years ago, Brush Wellman applied for a top honor given by the local United Way: the Heart **of** Volunteerism Award.

One of the company's key claims was that it had placed several full-time employees of its Elmore plant in public service positions.

Brush Wellman ended up winning the award - and told the media so in press releases.

This story is a real insult to the Brush Wellman employees who give their time and resources to help their communities. Please read it carefully.

This was actually ***one*** of numerous initiatives Brush described in preparing the nomination for the Heart of Volunteerism Award. The company has a comprehensive program **of** fostering community service among its employees, including Brush retirees. That year, at least 80 percent of our employees performed volunteer work, contributing an estimated 100,000 hours of time to the community over the course of the year. Among the beneficiaries were the United Way, the American Red Cross, the Erie-Ottawa chapter of Pheasants Forever and the Air National Guard. Brush's initiatives have ranged from creating its own annual fundraiser for the local heart association, the Chick Schaffner American Heart Classic, to developing a leadership giving program for the United Way that has become a model for Ottawa County, to converting 150+ acres of farmland to wildlife habitat. All totaled, a conservative estimate of the value of **cash** goods and human resources Brush and Brush employees contributed to the community in 1996 was $360,000. This was the basis for the Heart of Volunteerism nomination. The application was submitted and the award accepted on behalf of our employees, of whom we are justifiably proud.

But what the company didn't tell the United Way or the public was why these workers were volunteering in the first place.

From the company's perspective, the reason why those employees volunteered wasn't something that needed to be ***disclosed;*** there was nothing shameful or questionable about it then or now.

They had contracted beryllium disease at the plant and did not want to further expose themselves to the toxic metal. So Brush Wellman required them to become full-time volunteers or lease themselves to other companies instead of working at the Brush plant.

If they refused, they would lose their pay.

All affected employees signed an agreement to this effect, in accord with Brush policy to place them in a beryllium-free work environment.

One victim is now picking up trash and cutting grass in a low-income Toledo neighborhood.

This is a job the employee selected because it is in an area of Toledo where he owns property.

Another is counseling students in Genoa Area Schools.

This is a job the employee sought out, one which utilizes the degree he earned while working at Brush and for which his tuition was reimbursed. It has also been a life-changing experience. Quoting from a letter this employee sent to Brush, "Working for the Genoa Area School District has given me a new direction in life. One that I find to be enjoyable in the respect of doing good for the community, being in a work force and being able to make a difference in a young person's life."

Another is doing odd jobs for a shooting club at Camp Perry, an Ohio National Guard base.

The shooting club has been favorably affected and membership doubled because of this employee's dedication to the task.

"It's disgusting," says Dave Norgard, who has beryllium disease and has refused to do volunteer work. "It's a modern-day version of slave labor."

Four workers with beryllium disease, an often-fatal lung illness, are now doing public service work under this program, but some say they are being forced against their will and that Brush is using them as public relations tools.

"They're collecting awards for making people sick and then forcing them to work in jobs they don't necessarily want to do," says one of the workers, who requested anonymity.

Brush Wellman defends its program.

"We didn't do this to win an award or impress the United Way," says Dennis Habrat, Brush's director of occupational health affairs.

The program **was** created, he says, because an increasing number of workers were being diagnosed with beryllium disease, yet they had no visible symptoms. In the opinion of Brush and its medical director, these employees remained able to work.

But there was a problem: There was no place in the Elmore plant where victims could work without further exposure to deadly beryllium dust. Yet they were not sick enough to qualify for workers' compensation.

So Brush wanted to find them jobs as opposed to paying them for sitting home, **as** it had been doing in some cases for years.

What kind of alternative work they do is largely up to them, the company says. "We don't want to sentence somebody for life to some job they hate," Mr. Habrat says.

This is ludicrous. The company's objective was to provide these employees with meaningful work in a beryllium-free environment. Employees participated in selecting the work setting and our feedback is that the program was appreciated.

See above. No one had to work in a job he or she didn't want, and collecting awards was not even remotely an objective.

Brush officials say they know of no other company with such a program.

Victims deemed able to work have three options:

Continue working at the plant and risk further injury.

For the record, there is no data to support the claim that continuing to work in the plant carries the risk of *further* injury to one's health. Some employees elect to continue working at the Elmore plant.

Quit working and receive one year's pay.

Accept a job outside of Brush as a contract employee and continue to receive their regular Brush pay.

If workers volunteer for a nonprofit group, Brush receives nothing in return.

That was true when the program first began. Now, however, every organization to which Brush provides a contract employee pays the fair labor market wage for the job that is filled. Brush covers the employees' benefits, and makes up the difference between the wage for the contract job and what the employee was earning at Brush, if there's a difference. It is a win-win situation for all concerned.

But if they work for another business, that company reimburses Brush the amount it would normally pay for that position. There is one such case now: A beryllium victim is doing computer work for an Elmore manufacturer.

For those too sick to work, Brush supplements their workers' compensation pay so they earn the same as they did before they became ill. This generally lasts until they retire or die.

Brush began requiring some victims to volunteer or return to work in 1995.

One victim, Mr. Norgard, a 43-year-old from Manitou Beach, Mich., refused. ***So*** he has not received a paycheck from Brush in two years, though the company says it still considers him an employee and hopes he will eventually accept a public service job.

Mr. Norgard says he has refused because Brush changed the rules on him midstream: After he was diagnosed with beryllium disease, Brush agreed to pay him even if he didn't work; now it wants him to do public service work.

Plus, he says, "I don't want to be used as a pawn so Brush can win awards."

When Brush applied for the United Way of Greater Toledo's top corporate volunteerism award in 1997, the company had to fill out a form. Brush trumpeted many of its activities, saying that 80 per cent of its employees volunteer.

Prominently mentioned was the policy that places workers in community service positions. But Brush did not say that these workers had beryllium disease and that they had been paid to volunteer, records show.

United Way spokeswoman Kim Sidwell says that when the award was given the United Way did not know Brush was using victims as volunteers. She didn't know if that information would have precluded Brush from winning.

"They are great supporters of ours, and this is an issue between the company and their employees," she says.

Many other Brush workers with beryllium disease have chosen to continue working in the Elmore plant and risk further injury.

Considering the fact that Brush employees contribute significantly to the general community welfare, one wonders why ***The Blade*** feels justified in belittling their efforts. The company is proud of these efforts; why wouldn't we "trumpet" their extraordinary record?

Again, the reason why those employees volunteered wasn't something that needed to be ***disclosed;*** there was nothing shameful or questionable about it then or now.

Scientists do not know for sure if additional exposure aggravates the disease, but they have said for nearly 50 years that prudence dictates victims be removed.

Theresa Norgard, wife of Dave, the beryllium victim, says Brush has had years to find jobs within the company for sick workers.

"My God, you can't come up with a game plan in 50 years? They didn't want to do it. They didn't have to do it. *So* they didn't do it."

We do provide jobs in the company where they exist. One employee was relocated to our operation at Lorain, which is a beryllium-free environment.

PART 6

TAX DOLLARS BACK BRUSH

Part 6: Tax dollars back Brush

If you're a taxpayer, you have contributed to Brush

BY SAM ROE
BLADE SENIOR WRITER

If you think you haven't contributed to workers at Brush Wellman Inc. getting sick and dying, think again.

Millions of dollars in public money and tax breaks have gone to the beryllium producer to help it grow and thrive.

As *The Blade* knows but did not explain, far more millions of dollars have gone into the federal, state and local treasuries from income and property taxes paid by Brush Wellman.

Ottawa County once gave Brush Wellman the biggest tax break in county history.

See discussion on ensuing pages.

The Toledo-Lucas County Port Authority once built a plant for the company.

See discussion on ensuing pages.

And Cuyahoga County once gave Brush Wellman a property tax cut because its land was polluted - polluted, in part, by the company itself.

See discussion on ensuing pages.

While public officials have been quick to give Brush Wellman money, there is one thing they haven't done: ask many questions about how workers have contracted beryllium disease at Brush plants.

"I can't say that weighed very heavily in the decision" to give Brush Wellman a tax break, says Walt Wehenkel, an Ottawa County planner.

Lorain, *O.,* Mayor Joe Koziura says that when he recently backed a tax break for Brush, he had no idea workers at some of its facilities were becoming ill. That was never a part of any discussions, he says.

The average taxpayer has a stake in the matter: Some of Brush's tax cuts involve millions of dollars that would otherwise go to local schools and social services, such as nursing home and mental health care.

Those responsible for providing Brush with public money and tax cuts range from the **U.S.** Congress to local school boards. Some defend giving the tax breaks as a way to encourage new jobs. Brush, an international firm with about $400 million in annual sales, defends accepting them as a way to keep costs down.

"You're building a new plant to expand your revenue and income-base, and therefore you have to do it in the most cost-effective way that you can," says Brush spokesman Timothy Reid, who recently left the firm.

A Blade review of Brush Wellman's government aid shows:

For years, the federal government subsidized the company, at times practically saving it from closing.

The government didn't ***subsidize*** the company; see entries in the Chronology of Events for 1949 and 1979.

In 1996, state **and** local officials provided a massive package of tax breaks, loans, and grants for a project that promised to cut jobs, not create them.

That same year Lorain lured a Brush plant to town with a tax break even though the company left the city in disgrace 50 years earlier after numerous residents living near a Brush plant contracted beryllium disease.

"**I** would have never let that company come in," says Angela Barraco, whose husband and 7-year-old niece died of beryllium disease from the old Lorain plant, records show.

"I do believe that they ruined a lot of people's lives."

Based in Cleveland, Brush Wellman has facilities in 11 states. The firm is the nation's leading producer of beryllium, a hard, gray metal used in nuclear bombs and other weapons, as well as in the electronics and automotive industries. Brush has **2,160** workers, including **650** at its main plant near Elmore, **20** miles southeast of Toledo.

Since the 1940s, **127** Brush workers have contracted beryllium disease, an incurable, often-fatal lung illness caused by inhaling microscopic bits of beryllium. Researchers estimate 1,200 people have contracted the illness nationwide since the **1940s.**

Brush Wellman emphasizes it has contributed much to its communities. In the Elmore area, it has given thousands of dollars to the United Way, sponsored blood drives, and donated computers to Woodmore High School.

"And it's not like we aren't paying taxes," Mr. Reid, the Brush spokesman, says.

In **1998,** Brush officials say, the Elmore plant alone paid roughly **$3.6** million in state and local taxes.

That's in addition to the 'millions Brush provides in payroll. The average worker at the Elmore plant earns about **$18** an hour - a solid amount in a farming community with few factory **jobs.**

One year, 150 people camped overnight in the rain to get applications for only four openings.

"We put about $50 million a year, between salaries and local purchasing, in the five-county area around [the Elmore plant]," says Lyle MacAulay, Brush's director of manufacturing technology.

Sandy Buchanan, executive director of Ohio Citizen Action, the consumer and environmental group, says local governments should not fixate on such figures. She says they should use tax breaks as bargaining chips to encourage firms like Brush to improve health conditions.

"If you are going to give a public subsidy to **a** corporation, it's a huge opportunity to move things forward in the context **of** health and safety."

Butch Lemke, an Elmore resident who developed beryllium disease after working nine years at the Brush **plant,** agrees.

"What good is it to create 10 jobs and turn around and put these 10 people's health in jeopardy?"

FEDS HAVE BACKED BRUSH FOR YEARS

The federal government has backed Brush for years, and for a simple reason: It needs a reliable supply **of** beryllium for its weapons.

For if Brush were to ***go*** out of business, the government would lose its major beryllium source.

So the relationship between the **U.S.** government and Brush has been intimate since World War **11,** when America bought tons of the metal for the war effort. When Brush couldn't keep up with the demand, the government invested **$1** million to expand operations, federal records show.

After the war, the **U.S.** Atomic Energy Commission, which oversaw nuclear weapons production, remained Brush's biggest customer, accounting for two-thirds of all sales.

Other beryllium companies relied on government orders in the late **1940s.**

"This has placed the AEC in the uncomfortable position of exercising extensive control over a complete industry," a recently declassified AEC document states.

In **1949,** the government paid Brush to build and operate a plant in Luckey to produce beryllium for weapons and, subsequently, for the space program.

Still, the government feared Brush would fold if government orders dropped.

"The company **is** financially weak," an AEC official wrote in **1950,** "and its commercial business has been very limited for several years."

So the government continued to help Brush.

In 1957, Brush signed a contract with the government to build and operate a beryllium plant near Elmore.

In return, **U.S.** officials agreed to buy 50 tons of beryllium over five years.

Today, defense and aerospace products account for only five percent of Brush Wellman's sales.

In 1979, when Brush's only significant competitor dropped out of the beryllium metal business, defense officials agreed to pay Brush a one-time 35 per cent price hike to entice the company to remain a government supplier.

In recent years, Brush's government orders have dropped sharply, largely because of the end of the Cold War. But the government still needs some beryllium for weapons, and so it remains concerned about Brush's financial health.

As explained earlier, this price increase only allowed Brush to charge the government what it charged commercial customers.

In 1982, the **U.S.** Department of Energy gave the company a $3.5 million grant to study how to improve production and safety, and in 1994, the **U.S.** Defense Department provided $2 million to help Brush and several other businesses convert their defense technologies to commercial uses.

The DOE grant resulted in numerous recommendations to improve environmental control of existing beryllium production processes, many of which were implemented, beginning in 1985, with favorable results. The federal Defense Advanced Research Projects Agency's intent was to foster industrial partnerships that would result in new commercial applications for defense-aerospace technologies. Brush competitively bid for two projects successfully and provided matching funds for the government dollars. Rep. Marcy Kaptur was instrumental in getting the federal dollars appropriated.

TAX BREAK GIVEN FOR CUTTING JOBS

A few years ago, when Brush Wellman was thinking about expanding its plant near Elmore, local officials put together a rich package of tax breaks, grants, and loans.

This was a $110 million expansion, at the time one of the largest potential capital projects in Ohio. An alternative approach with an out-of-state joint venture partner was imminent. The port authority, with state cooperation, helped preserve the jobs in Elmore by providing a cost-effective means of financing the project here, resulting in an additional influx of dollars to the local economy.

Yet the company was not promising to create a single job.

In fact, officials expected Brush to cut **40** jobs.

Jobs have actually increased, from **649** in **1996** to **780** at the end of last year.

Local officials defend the deal, saying that if Brush had built outside Ohio, the Elmore plant would have lost 150jobs.

"I think it's important for the community to protect what you've got," says Jerry Arkebauer, vice president **of** finance and strategic initiatives for the Toledo-Lucas County Port Authority.

When Elmore landed the $1 **10** million expansion in **1996,** "it was the talk of the county," Ottawa County Commissioner Chris Redfern recalls. "Everyone was excited - and still is."

Not surprising in view of the expanded support to the local communities and schools the expansion has brought in the form of additional property, sales and local income taxes. Property taxes alone have increased from **$1.345** to **$1.85** million.

The county gave Brush a 10-yeartax break on personal and real property - money that otherwise would have gone to schools and social service agencies.

Under a separate agreement, the schools will receive **$2.5** million over the same period, and Brush advanced $100,000 for their immediate needs.

Total savings for Brush: **$7.5** million.

Commissioner Redfern says no one voiced opposition to the tax break, and local schools approved the deal.

The schools didn't come away empty-handed: Brush agreed to directly pay the schools 25 per cent of what it would have otherwise paid.

County officials acknowledge few questions were asked about **Brush's** health problems at other plants.

"It's beyond my expertise to do that," says Walt Wehenkel, the county planner who helped negotiate the tax break.

Commissioner Redfern says beryllium disease was a concern to him, but Brush assured him the new plant would have safeguards.

Plus, he says, relatively few workers at the main Elmore plant have the disease. He doesn't know exactly how many: "It's 1 in 150, 1 in 200, as far **as** I know."

In reality, a recently published study found 1 in 11 have the disease or an abnormal blood test - a sign they may very well develop the illness.

This calculation is derived from a study of 59 of 646 employees. Of the 59 who had a positive blood test, **24** displayed actual evidence **of** beryllium effect on the lung; the others had a positive blood test only. None were ill at the time.

Meanwhile, the Toledo-Lucas County Port Authority, a public agency, put together a **$20** million financing package - $15 million in bonds and a ***$5*** million low-interest state loan.

The bonds issued by the Port to cover building construction were at market rates and spreads in line with Brush's credit rating; lease rental payments cover the bond obligation.

Under the agreement, the port would construct and own the plant and lease it back to Brush for 15 years. The port did this to allow Brush to keep long-term debt off its books, making the company look better to investors.

In addition, the port orchestrated a lobbying effort to sway state officials to approve the $5 million loan. It was a special loan - five times greater than the usual allowable amount.

In all, port authority documents on the Brush deal stand three feet tall. Yet there is scant information about the health problems.

The port's Mr. Arkebauer says port officials discussed the issue, and it was indeed a concern.

"We look at it as: Is it going to impair the ability of the company to make the debt service payments? In our opinion, it was not."

He says he did not know off-hand what percentage of workers were sick at the Elmore plant, but from the port's point of view, he believed it was "an acceptable amount."

BRUSH GETS TAX CUT ON LAND IT POLLUTED

Brush once polluted a plant site, then received a large property tax cut because of the contamination.

"This is a real loophole. It's really lousy," says Richard Linhart, a real estate analyst for the Cuyahoga County board of revision.

The Brush site is ***66*** acres in the Cleveland suburb of Bedford. In **1994,** Mr. Linhart says, the taxable value of the property was $1.6 million. That year, Brush appealed the assessment, saying the property was so contaminated with lead and toxic chemicals that it was worthless. The company argued that it should pay no taxes.

When the county rejected that argument, Brush appealed to a state tax board. County officials then decided to compromise with the company: The taxable value of the property would be reduced to $400,000 - a 75 per cent cut.

To date the company has spent $5.7 million cleaning up a site that we owned for not even half of the 36 years it had operations there. **A** substantial amount of Brush's clean-up costs at this plant has been for contamination caused by previous owners. Brush exercised its right under the law to reduce its property tax, a law that requires property to be taxed at its current fair market value. **A** major portion of the property value reduction was due to the dismantling of the outmoded manufacturing building, solely at our expense.

So Brush is now paying thousands of dollars less a year in taxes, says James Hopkins of the Cuyahoga County board of revision. He says that means less money for local schools.

Mr. Linhart says Cuyahoga County settled with Brush because it wanted to avoid losing a lawsuit. "I didn't want this to become a precedent," he says.

The tax cut, first reported in The (Cleveland) Plain Dealer, was rare but legal: State law allows property to be devalued because of pollution, and it doesn't matter if the owner caused it.

Brush acknowledges it polluted the property but says it is not solely to blame: It owned the factory only 14 of the 36 years the plant was operating.

The factory, which made brake parts for heavy-duty trucks for Brush subsidiary S.K. Wellman, closed in 1988 and was torn down in 1993.

Mr. Reid, the Brush spokesman, says the money the company saved on the tax cut has been greatly negated by the $6.5 million spent so far on pollution cleanup.

Even if Brush is able to sell the vacant property, he says, it will be at a loss. "We're not going to get our money back."

DESPITE TRAGIC PAST, LORAIN WELCOMES BRUSH

Back in the 1940s, residents near Brush's factory in Lorain were contracting beryllium disease from the plant's air pollution,

Fear gripped the city, and more than 600 residents signed a petition to force Brush to leave town.

The company voluntarily moved to the country, far from residents and another potential disaster.

The Lorain plant was destroyed by fire in **1948,** and was replaced with the government-owned, contractor-operated Luckey plant in **1950.**

Five decades later, Brush is back in Lorain - thanks to taxpayers' money.

In **1996,** the city gave Brush **a** 10-year tax break to build **a** plant in its west side industrial park. The savings to Brush: $1 million.

The abatement was premised on Brush committing to a significant investment in a new plant, property and equipment. The company invested **$14+** million in this project as of the end of last year, will pay **$92,000** in property taxes for **1998,** and created **28** tax-generating jobs.

The plant, which has **3**1 workers, manufactures bronze materials for aircraft landing gear, drilling equipment, and plastic molds.

Mayor Joe Koziura says beryllium disease was not an issue when officials approved the tax break.

A few residents, he says, did recall the tragedy of the **1940s** at public meetings, but he thought the disease was in the past.

Had he known workers were still getting sick, "**I** would have been more concerned and have said, `Hey, what is going on here?' "

Yet he does not expect a repeat of the tragedy. Brush, he says, has assured him the plant will not handle beryllium.

In an interview with The Blade, the Brush spokesman did not rule out that the deadly metal might **be** handled there someday.

"But that is not the plan, and it never was the plan," Mr. Reid says.

Some are upset that Brush was allowed to return to Lorain.

"I can't understand why Lorain would want them back," says Angela Barraco, whose husband, Al, and 7-year-old niece, Gloria, died of beryllium disease from the old plant. Researchers in the **1940s** concluded that Gloria got it from air pollution; Mr. Barraco worked in the plant briefly.

Mrs. Barraco, 79, of Avon, O., keeps her husband's papers and photographs in an album, including pictures of him wearing his oxygen hose.

"I want my grandchildren to remember what he had to ***go*** through," she says.

Cheryl Sanders's father, Stanley Sobocienski, lived near the plant and died of the disease in **1946,** researchers concluded. She was just ***5*** at the time.

"The only thing I remember is that he was sick, that he wasn't able to work," recalls Ms. Sanders, 57, of Amherst, **O.** "That's about **all** I really **know** about my father."

She says it was wrong for Lorain to lure the beryllium company back.

"They were here once, and they had to move out. They should have just stayed away."

Brush has not used beryllium at the facility to date and continues to have no plans to use it in the future.

Part 6: Tax dollars back Brush

Brush backs politicians - and vice versa

BY *SAM* ROE
BLADE SENIOR WRITER

Brush Wellman Inc. has had many friends in high places.

U.S. Sen. Orrin Hatch of Utah once opposed a worker safety plan that would have cost the company millions of dollars.

Toledo Congresswoman Marcy Kaptur once obtained federal funds for the company to help it convert its defense technology to commercial uses.

And U.S. Rep. James Hansen of Utah and U.S. Rep. Paul Gillmor of Ohio once pushed legislation that could have potentially exempted the company from proposed mining rules and fees.

Likewise, Brush Wellman has backed these lawmakers - with thousands of dollars in campaign contributions.

This is untrue. It is illegal for Brush Wellman or any corporation to contribute to candidates. The contributions in question were made by a legally authorized Political Action Committee which is made up **of** individuals at Brush Wellman who voluntarily contribute to the fund to support candidates they favor.

Since 1988, Congressman Gillmor has received $26,500; Congressman Hansen, $24,400; Senator Hatch, $10,000, and Congresswoman Kaptur, $2,000, a review of Federal Election Commission records shows.

Overall, Brush Wellman has donated a total of $187,700 to 47 lawmakers and candidates since 1988. Most have been Republicans running for Congress in states in which Brush has beryllium plants, such as Ohio, Pennsylvania, and Utah.

The contributions are perfectly legal: The money comes from Brush's political action committee, or PAC. It was created in 1987 and is called the Brush Wellman Good Government Fund. Brush's PAC money comes from payroll deductions from some of the company's top executives.

"It's the company's right - it's anybody's right - to petition government," says Hugh Hanes, Brush's vice president of government affairs.

"Our participation in a PAC is no different than labor organizations, or environmental organizations or other people that support candidates that support the principles that they believe in."

He says Brush does not expect politicians to give Brush favors in return for donations.

"Frankly, I don't think any representative or member of Congress would be influenced by the modest amounts that the [Brush] PAC gives."

Brush documents turned over in recent lawsuits show the company does expect certain lawmakers to back the firm.

The maximum contribution ever given to an individual campaign by Brush's political action committee – not by Brush Wellman – was $5,000; contributions for a single campaign normally range from $500 to $2,000 at the federal level and less at the state level – this is all scrupulously regulated by campaign finance laws.

In our relationship to government at all levels, Brush Wellman asks for only one thing – fair and consistent treatment. Every individual and business has a right to expect that, and it's our constitutional right *to* petition government in matters that affect **us.**

When Congress was debating several bills affecting American manufacturers in **1987,** Brush executive Richard Davis offered a lobbying strategy in a memo to Brush colleague James Gulick.

"Since these are issues which will impact all manufacturers, not just Brush Wellman, I don't believe we should 'use up any favors' owed **us** by our most reliable supporters," Mr. Davis wrote.

In a related memo, Mr. Davis wrote that Brush official Stephen Zenczak would monitor the legislation with "Orin (sic) Hatch's people" and that Mr. Zenczak "agreed we shouldn't use up our favors on a bill that won't have as big an impact on [Brush] as on the rest of industry."

Mr. Zenczak, now retired from Brush, says Senator Hatch has long been a friend of the company, which has a mine and plant in the senator's home state of Utah. **He** says Mr. Hatch, a Republican, has frequently helped Brush gain access to key **U.S.** officials, such as those in the Defense Department**.**

"You just can't knock on the doors of those [officials] and say, '**I** want to talk with you,' " Mr. Zenczak says.

Hatch aide J.J. Brown says Brush is a constituent, and Senator Hatch helps constituents who have legitimate requests.

Campaign contributions do not influence whom the senator helps, the aide says. Most constituent requests are handled by staffers, who do not know who has given money. "To me, contributions are irrelevant."

Senator Hatch would not turn over to The Blade any documents he had regarding Brush, pointing out in a letter that Congressional offices are exempt from public records laws.

But documents obtained from the Energy Department show that Senator Hatch once opposed a worker safety plan that would have cost Brush millions of dollars.

In **1975,** the Occupational Safety and Health Administration proposed lowering the limit of deadly beryllium dust that workers could **be** exposed to. In 1978 and **1979,** Senator Hatch weighed in on the issue, writing to Labor Secretary Ray Marshall, **U.S.** Sen. Sam Nunn, and Health, Education, and Welfare Secretary Joseph Califano, Jr.

At first, Senator Hatch questioned the scientific studies on which the safety plan was based. When a panel of independent experts verified the science behind the plan, Senator Hatch tried a different approach: He wrote to Senator Nunn, a member of the Armed Services Committee, saying the plan could harm national security.

In the end, the worker safety plan died.

See **A** Chronicle of Reckless Reporting, "The Fiction of a Secret Deal."

Today, Senator Hatch says he only vaguely recalls the issue and could not comment, according to his chief of staff, Patricia Knight.

Another Utah Republican who has received Brush **PAC** money is Congressman Hansen. His district includes Brush's Utah plant and the open-pit mine, where the company extracts beryllium-containingore.

In 1993, Congressman Hansen tried to help Brush on a bill that would have required mining firms to pay higher fees and royalties on the minerals they mined.

As House members debated the bill, Congressman Hansen proposed an amendment that could have potentially exempted Brush. He wanted to give the Defense Department the power to exempt firms like Brush Wellman to ensure ample national defense materials. He said forcing Brush to pay increased royalties could threaten the **U.S.** beryllium supply.

Congressman Gillmor, a Republican whose district includes areas near Brush's Elmore plant, agreed. Holding a piece of beryllium-containing ore, he told colleagues they should not "damage critical industries that are of strategic importance to our national defense."

In the end, Mr. Hansen's amendment failed, 193 to 238. **U.S.** Rep. George Miller, a California Democrat, called it "an outrageous amendment, all in the name of national security."

Both Mr. Hansen and Mr. Gillmor deny that campaign contributions had anything *to* do with their actions.

"**Of** course not. Patently absurd," Hansen aide Bill Johnson says.

Congressman Hansen, he says, was trying to protect beryllium supplies for national security purposes. "There is one beryllium mine in this country. It happens to be Brush Wellman."

Christopher Slagle, press secretary for Congressman Gillmor, says: "We make legislative decisions based on the merits of the decisions in question.... There's no quid pro quo between a contribution" and a political decision.

Mr. Gillmor has backed Brush in other ways. In 1996, he gave a glowing tribute to the company in honor of its community party called "BrushPride Day." He entered the speech in the Congressional Record, calling Brush "a model citizen."

"**As** their mission statement so aptly states: 'We are committed to on-time delivery of defect-free competitive products and services to all of our customers by always performing to requirements.' "

As for Toledo Congresswoman Kaptur, a Democrat, Brush has both backed and opposed her. Likewise, she has both helped and hurt the firm.

From 1988 to 1995, Brush's **PAC** did not give her any money. In fact, in 1992, when her district expanded to include the Elmore plant, Brush contributed $5,000 to her opponent.

And the opponent was not just anybody: He was Ken Brown, a Brush Wellman chemical engineer. Mr. Brown, the endorsed Republican, was trounced by Ms. Kaptur, capturing only 25 per cent of the vote.

A few months later, in May, 1993, Ms. Kaptur sparked an **OSHA** inquiry of Brush's Elmore plant.

"I have received several complaints from current and former Brush Wellman employees regarding the conditions at that plant," she wrote to **OSHA's** Toledo office. "I am quite concerned that people could become terminally ill simply because of where they work."

OSHA found **11** violations, and Brush paid **$12,350** in fines.

A year later, in 1994, Ms. Kaptur was helping Brush. Her amendment to a Defense Department spending bill gave **$2** million to several businesses, including Brush, to help convert defense technologies to commercial uses.

In a press release, she said national security was at stake.

"If the United States fails to convert quickly to commercial applications for beryllium, our nation will lose its production capability and be forced to purchase future supplies from either China or Kazakhstan."

Since 1996, Ms. Kaptur has received **$2,000** from Brush.

She says she has had two long-standing concerns regarding Brush: protecting the workers and maintaining jobs at the Elmore plant. "I've tried to work on both fronts," she says.

See **Part 6,** Article 1 for background on this subject.

Rep. Kaptur has always articulated her position to Brush management. We have supplied her with extensive information on CBD and environmental health and safety at the plant. In addition, we worked with her to secure funding for the National Institute of Environmental Health & Safety to independently research CBD.

Part *6:* Tax dollars back Brush

More than dust at Elmore: Ohio EPA finds Brush has polluted air, land, water

BY *SAM* ROE
BLADE SENIOR WRITER

ELMORE - For 17 years, state officials warned Brush Wellman Inc. that its plant here was contaminating the groundwater.

In 1981 Elmore commenced extensive groundwater monitoring which it was required to do under the federal Resource Recovery and Conservation Act. Groundwater contamination was found near permitted – but now inactive and closed – lagoons. The contamination is being addressed as part of a comprehensive corrective action plan being implemented under the supervision of both the Ohio and **U.S.** EPAs. The contamination is contained on the Brush site.

But year after year, the problem continued.

Now, officials say, the pollution is creeping toward the Portage River and threatening several residents' wells,

This is not true. Neighbors' wells have been tested regularly prior to the 1990s **as** well as recently. No threat exists. This was confirmed in recent sampling done **by** OEPA itself. Brush currently operates 57 on-site monitoring wells for the purpose of detecting and tracking the movement of the groundwater contamination.

"This is one of our bigger issues in northwest Ohio," says Jeffery Steers, assistant chief of the Ohio Environmental Protection Agency district office in Bowling Green.

OEPA's Northwest District has relatively few large manufacturing plants. Anything pertaining to Brush's Elmore plant by definition is considered a major issue by the Bowling Green office.

The tainted groundwater is one example of how Brush Wellrnan has created serious public health problems other than exposing its workers to dangerous beryllium dust.

Again, the reporter inserts his opinion into a story. Brush knows of no official documents which either state or imply that "serious public health problems" have been created at Elmore due to air, groundwater or any other environmental issue.

Ohio EPA records show that Brush Wellman'sElmore plant - the company's main facility - has violated dozens of environmental rules over the years, overpolluting the air, water, and ground.

The vast majority of the incidents were minor and posed no risk to the environment or to public health. It's important to note that sometimes a single event causes multiple rules to be violated. In any case, all incidents were quickly responded to, reported and corrected.

Some violations involve highly toxic materials.

"Brush Wellman has a history of noncompliance with respect to Ohio's hazardous waste laws," one Ohio EPA record states.

More accurately with respect to recent times, violations that occurred in the mid-1990s were mostly administrative in nature, posed no threat to public health or the environment and were immediately corrected.

EPA officials estimate that 1,500 residents are potentially exposed to injury from Brush's plant near Elmore, **20** miles southeast of Toledo. The risks include contracting beryllium disease from air pollution and being poisoned from tainted drinking water.

Brush does not believe the risk suggested exists. We perform comprehensive air, wastewater and groundwater monitoring on a routine basis. There is no evidence or indication of harm to the public's health or to the environment.

A review of Ohio EPA documents on the Elmore plant shows:

The company has exceeded monthly air pollution limits for beryllium dust nine times in the last **25** years. This is significant because residents in other communities have contracted beryllium disease from air pollution and died.

Brush only knows of two exceedances in the past decade, in 1989 and 1990. The processes involved were stopped and the problems remedied immediately. The monitoring system performed as it was designed to do and the exceedances posed no harm to public health or the environment. Use of the term "significant" is misleading; an apparent reference to one community – Lorain – decades ago when exposures were thousands of times higher and where disease was attributed to contact with workers' clothing rather than ambient air pollution.

It is unclear how the emissions have affected residents near the Elmore plant because no tests have been done.

There are no reported or known cases of **CBD** relative to Elmore neighbors since its start-up in 1953. Brush has continuously improved its controls and practices to ensure the safest possible operation.

Brush has had more than 250 EPA violations over the past 20 years, and the EPA has fined the company more than $275,000 since 1987.

The majority of violations on record were reported by the company to the OEPA pursuant to the extensive self-monitoring and self-reporting requirements under which the plant operates. For example, in a single month the plant reports several hundred wastewater measurements to the agency. Numerous other monitoring and compliance reports are filed with respect to air pollution control, solid waste management and other environmental programs. While Brush tries to avoid any violations and acts to remedy any violation quickly, they are the rare exception at the Elmore plant.

Since 1990, Brush has reported 29 spills, including releases of sewage and beryllium.

All releases were immediately reported and corrected.

The contaminated groundwater **is** the most pressing issue, Ohio EPA officials say.

The groundwater contamination is discussed above.

The underground pollution includes lead, arsenic, and mercury. The EPA says there is no evidence that it has moved off of Brush's property, but it is headed that way and is 1,500 feet from the nearest home.

As noted above, the chemical constituents of the groundwater are monitored carefully; the contamination referred to is confined to the Brush property and has not moved perceptibly for some time.

The EPA recently tested five residents' wells, and none showed problems. "But it's still an important issue for us," the EPAs Mr. Steers says. "We see it as a problem that still needs to be corrected."

How can Brush correct a problem that isn't **a** problem? The groundwater has been and is being studied in conjunction with OEPA **as** part of **an** ongoing plan approved by the agency.

EPA officials have known for 17 years that Brush has been polluting the groundwater, but they have not stopped it. Mr. Steers blames the delay on government ineptitude and disputes between the Ohio EPA and Brush over the seriousness of the problem and the accuracy of test results.

Some of the pollution is coming from a closed Brush landfill next to the Portage River, says Don North, an Ohio EPA environmental specialist. He says the landfill will be a problem indefinitely. "They'll be monitoring the groundwater out there forever," Mr. North says.

Brush defends its environmental record.

"We've had accidents and problems, but we don't ignore them," says Marc Kolanz, Brush's environmental health and safety director.

He says many of the violations are inconsequential - paperwork problems, for example. "I don't care what plant you go to: **You** are going to find a violation," Mr. Kolanz says. "There are too many rules and regulations not to."

As for the tainted groundwater, he says it is not widespread, not spilling into the Portage River, and not a community threat. Brush has been monitoring the problem, he says, and will continue to do so.

Brush's pollution problems in northwest Ohio date to the 1950s, when the company's now-closed plant in Luckey dumped waste into the Toussaint River.

To be clear, Brush is not actively polluting the groundwater by ongoing activities. The pollution stems from the now-closed lagoons. In environmental investigations of this detail and complexity, there is unfortunately always a significant expenditure of time involved in the agency reviewing the data collected by the company and approving next steps.

This wasn't waste; it **was** wastewater from wastewater treatment facilities discharged into the Toussaint pursuant to **a** permit from the Ohio Department of Health.

One year, a farmer downstream from the plant claimed that when the river flooded, waste from the beryllium plant spilled onto his farm, ruining his land and sickening his herd of 47 cattle.

His claim was disputed.

He sued Brush, and the firm settled out of court for $12,500. Brush's lawyers, company records show, thought that if the case went to trial, a jury in rural Ottawa County would likely give the farmer "a substantial verdict."

A few years later, in 1966, pollution from Brush's Elmore plant killed 137,000 fish in the Portage River, the Ohio **EPA** reports. Brush says the cause was never determined.

In recent years, inspectors have noted green sludge at the plant, a blue liquid in the river, and heavy foam on Hyde Run, a creek on Brush's property.

Copper is most likely the source of the wastewater treatment sludge's green color. The sludge is disposed of at Brush's licensed landfill for hazardous materials. The blue liquid referred to was a fine blue solid material found by us in Hyde Run Ditch. It was removed within hours of discovery. An abandoned pipe was found to be the source of the material and it was removed as well. The heavy foam is a common byproduct of soapy wastewater.

In 1996, the company was fined $225,000 for numerous violations related to handling and storing hazardous and solid wastes.

The violations were mainly administrative in nature. There was no risk to public health or the environment.

During an inspection that led to the fine, the **EPA's** Steve Snyder noticed a powder from a landfill blowing with the wind "and possibly off site." One worker in the area had a respirator on; another had a protective suit.

The powder was graphite and did not contain beryllium. The wearing of personal protective equipment is standard operating procedure.

But inspector Snyder was not wearing a respirator and was incensed that Brush did not warn him that he might need one. EPA officials wrote a heated letter to the company: "We are troubled by Brush Wellman's irresponsible actions in this matter."

Brush responded by saying that the dust was likely not beryllium and that its workers were wearing protective gear for other jobs.

For citizens near the plant, air pollution is a threat. Beryllium dust can be deadly, lodging in the lungs and causing an often-fatal disease.

The inspector was in no need of a respirator due to his location. There was no risk to him of exposure to anything harmful.

Pollution is not a threat, thanks to Brush's extensive external ambient air monitoring program. Exceedances have occurred only twice in the last decade; both times operations at the plant were shut down until the source was identified and corrected. Beryllium emissions from the Elmore plant are regulated by the U.S. EPA. The standard is 0.01 ug/m3 as a monthly average concentration, measured in the vicinity of the plant rather than at the end of a stack. The plant was designed to meet this standard in 1958, and monitoring has been ongoing since then – including voluntarily from 1962 through 1973, after the AEC standard ceased to be applicable and before the EPA standard took effect. The present monitoring network consists of nine stations which operate continually; the network was designed in consultation with EPA and its efficiency confirmed by EPA following its own independent, year-long study. The monitoring data is collected weekly and reported to the EPA monthly. Typical sampling results are five to 10 times beneath the standard.

There is a strict monthly emission limit, and Brush has nine monitors around its plant to take samples. In the last **25** years, the plant has exceeded the limit nine times. The most recent violations were in 1989 and 1990, and the EPA fined Brush $46,000.

Brush says neighbors have not been tested for beryllium disease because there is no indication they are getting sick.

"My guess is it's not needed," Brush Medical Director Dr. David Deubner says.

State officials have also been concerned about Brush polluting the water.

Brush is allowed to discharge treated wastewater into its creek and the Portage River.

But frequently, the concentration of the waste exceeds limits. In the last 20 years, Brush has had more than 150 violations for overpolluting the river or creek, **EPA** records show.

Given the number of measurements taken each week, this number of violations is certainly a possibility.

In recent years, the EPA's Mr. Steers says, Brush's compliance has improved.

And Brush has reported 29 spills since 1990. In fact, between 1989 and 1994, the company **"was** the single leading source of spills in the Portage River basin with 15 episodes," an Ohio EPA record states.

With one exception, caused by a tank leak, plant spills since 1990 have involved wastewater and sludge from wastewater treatment. These were minor incidents. Spills are immediately contained and cleaned up and generally pose no threat to public health or the environment.

A 1995 Ohio **EPA** study found that overall, the plant has had little effect on fish in the river. But it detailed several concerns:

Sediment samples in the river just outside Brush were "grossly polluted" with high levels of beryllium, copper, and polychlorinated biphenyls, commonly known as PCBs.

We are not sure what "grossly polluted" means. The beryllium, copper and PCBs were present in sediments in the Portage River at the mouth of Hyde Run where Brush's permitted discharge enters the river. The **OEPA** concluded that the effects of these sediments on the fish population were minimal. In fact, the **OEPA** has reported that the Portage River estuary, which begins about two miles downstream from Brush, is "one of the four best performing Lake Erie estuaries because of low municipal/industrial impacts."

Levels of nitrate-N, a form of nitrogen that can cause excess algae growth, were so high that they damaged the lab equipment.

Elevated levels of PCBs were found in fish caught outside the plant, posing "a moderate health **risk** for human consumption."

Due to the widespread presence of PCBs, similar fish consumption advisories exist for many species in Lake Erie and most of its major tributaries. Brush has sampled storm drains and the mouth of Hyde Run for PCBs on a monthly basis since 1996. This sampling has not detected any PCBs. The Elmore plant formerly used hydraulic oil and transformers that contained PCBs. The plant's current use of PCBs is restricted to capacitors, which contain, but do not release, PCBs. The contamination in the buried sediments in Hyde Run south and west of the plant is being addressed under a corrective program supervised by the state and federal EPAs.

Residents say many people fish near Brush's plant.

"In the spring they come out for white bass," **says** Pete Willett, a retired chemist who lives next to the plant. "All kinds of people are wading out there."