

Welcome to DES
&
to Today's Workshop
"Understanding Asbestos:
From Product to Waste"

Why Are you Here?

- ◆ Required by law and NH Solid Waste Rules.
- ◆ Build your resume & accumulate professional development hours.

Why this Workshop?

- ◆ Top 10 most dangerous jobs
 - 33 deaths per 100,000 FTE
 - Due to accidents and exposure to hazardous materials and heavy equipment

Desktop Materials & Displays

- ◆ Agenda
- ◆ Evaluation
- ◆ Part of Env-Sw 900 Rules
- ◆ Asbestos samples
- ◆ Books & posters
- ◆ Scrolling pictures and images related to asbestos.

Today's Agenda

- ◆ Health Concerns of Asbestos
- ◆ History of Asbestos Use & Production
- ◆ Current Uses of Asbestos & Asbestos in the Waste Stream
- ◆ Break

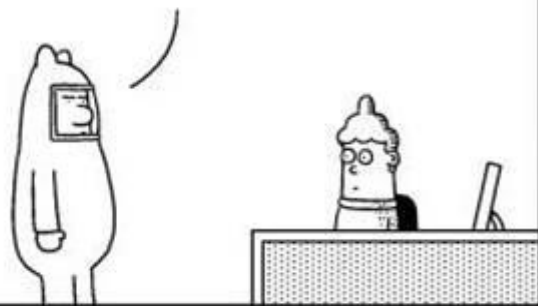


Today's Agenda

- ◆ Asbestos Regulations
- ◆ Best Management Practices
- ◆ SW Operator Renewals
- ◆ Q&A

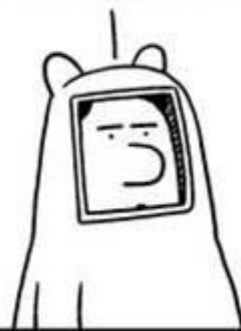


THE FACILITIES
PEOPLE TELL ME
THERE'S ASBESTOS
IN THE CEILING.



www.dilbert.com scottadams@aol.com

THEY SAY YOU
DON'T NEED TO
WORRY ABOUT IT
UNLESS IT GETS
DISTURBED.



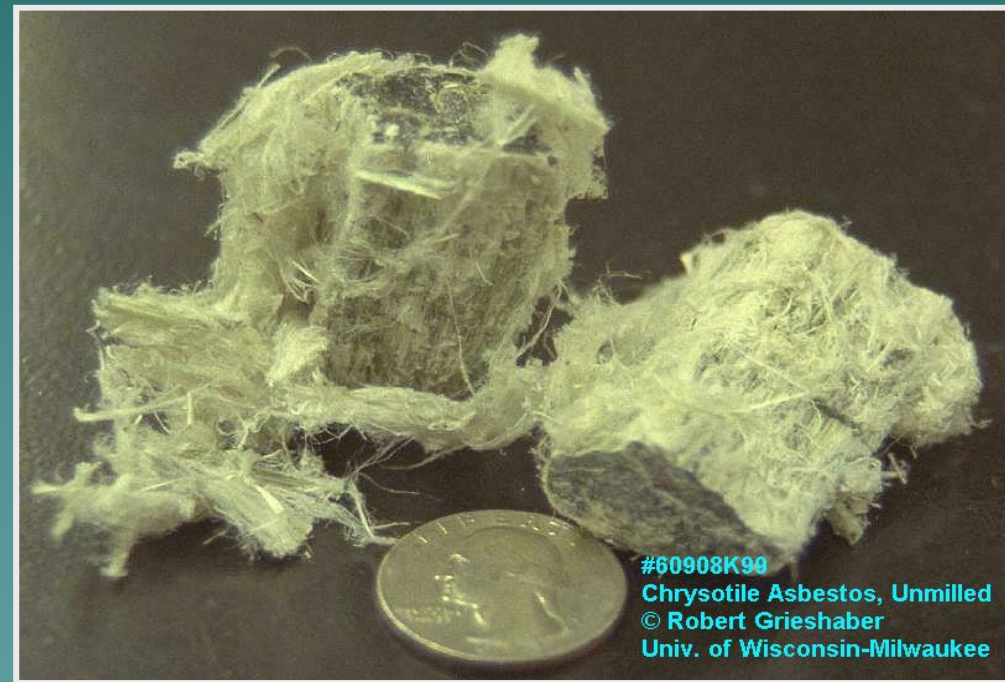
2-26-07 © 2007 Scott Adams, Inc./Dist. by UFS, Inc.

THEY
PLAN TO
DISTURB
IT TODAY.



What Is Asbestos?

- Naturally Occurring Mineral
- Made of:
 - ✓ Magnesium
 - ✓ Silicon
 - ✓ Oxygen
 - ✓ Hydrogen
- Most Common Types
 - ✓ Chrysotile (Fibers)
 - ✓ Amosite (Needles)



Some Characteristics

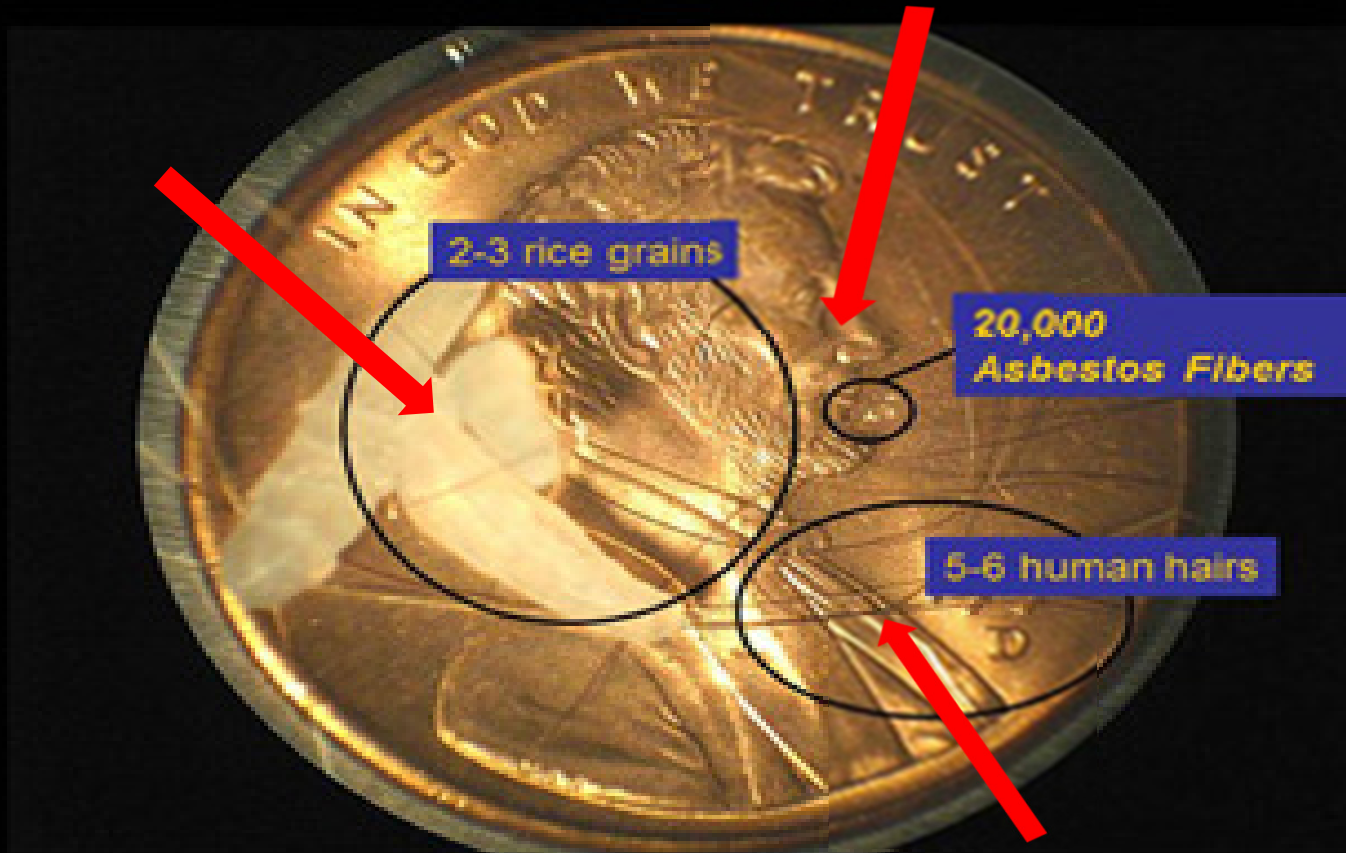


#60908K98
Chrysotile Asbestos, Unmilled
© Robert Grieshaber
Univ. of Wisconsin-Milwaukee

- ◆ High Tensile Strength
- ◆ Nonconductive
- ◆ Non-combustible
- ◆ Resistant to Corrosion
- ◆ Strong and Flexible
- ◆ Light weight
- ◆ Microscopic Fibers
- ◆ Non-Biodegradable

Microscopic Fibers

How small is asbestos?



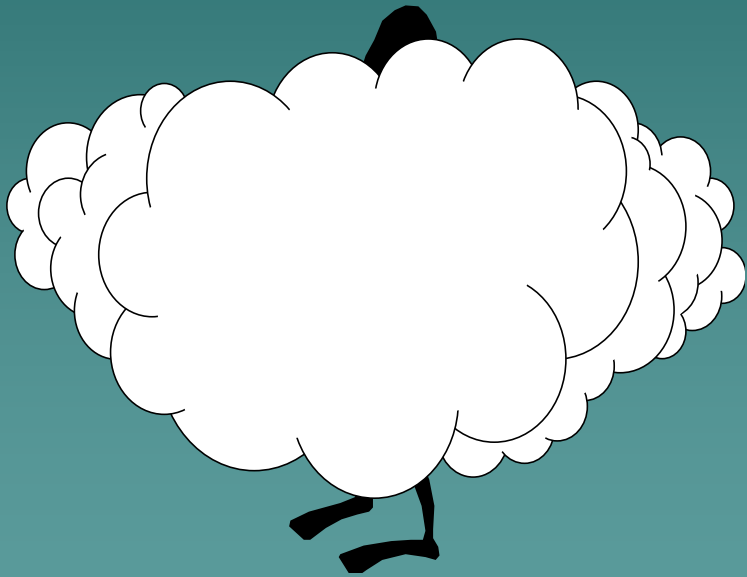
www.AsbestosDiseaseAwarenessOrganization.org

What are the Health Concerns?

Routes of Exposure

- ✓ Inhalation
- ✓ Ingestion

Inhaling fibers can cause serious health effects. Fibers can be deposited within the lungs.



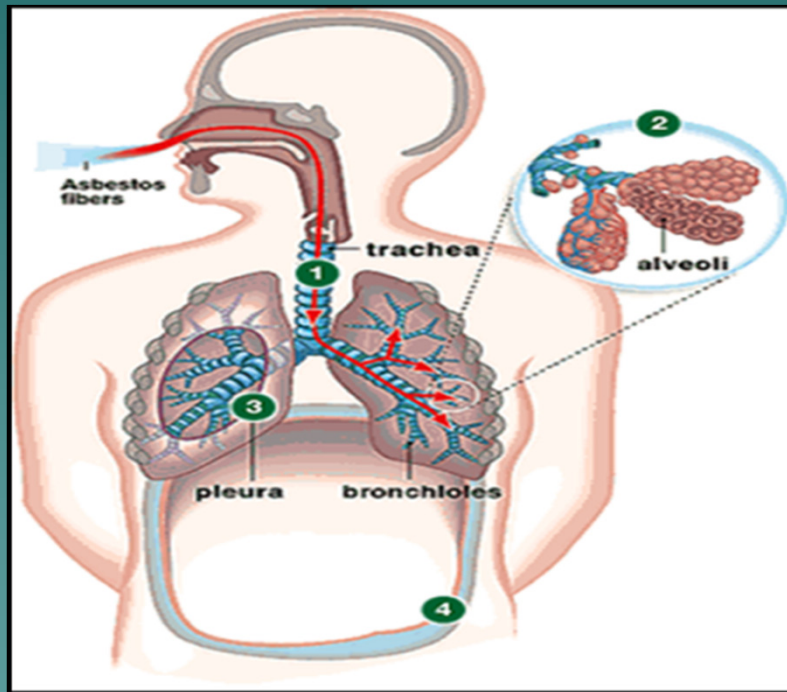
Hazardous Air Pollutant

First & Second Hand Exposure

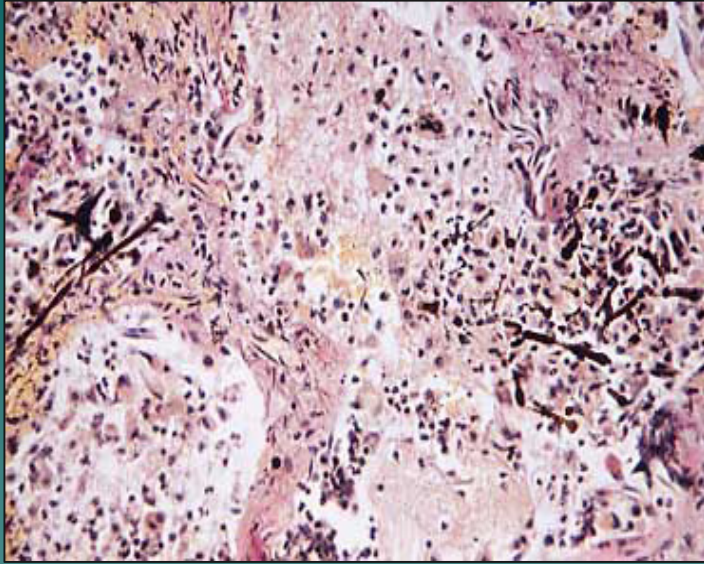
- ✓ You (inhalation, clothing, shoes)
- ✓ Your Co-Workers
- ✓ Residents
- ✓ Family and Friends



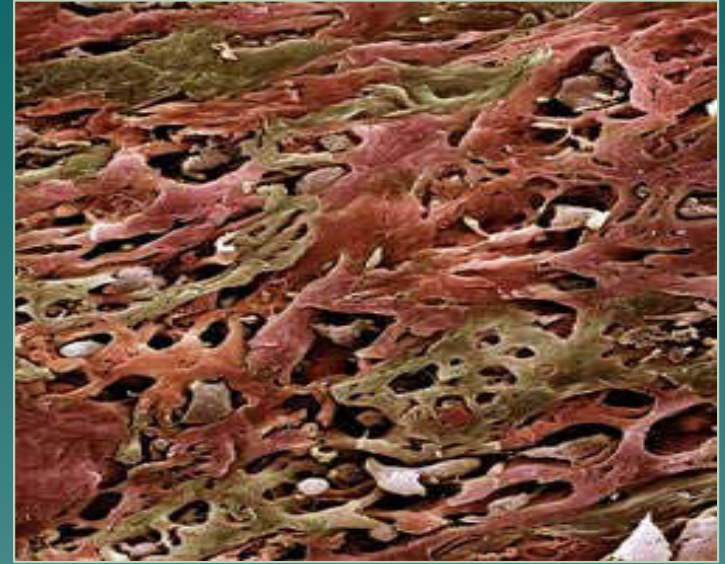
Types of Diseases



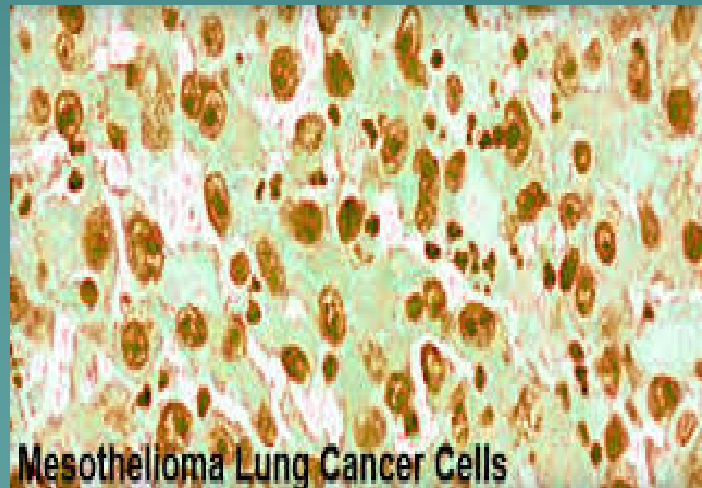
- ◆ Lung cancer
- ◆ Mesothelioma
- ◆ Asbestosis
10 to 40 years
before symptoms



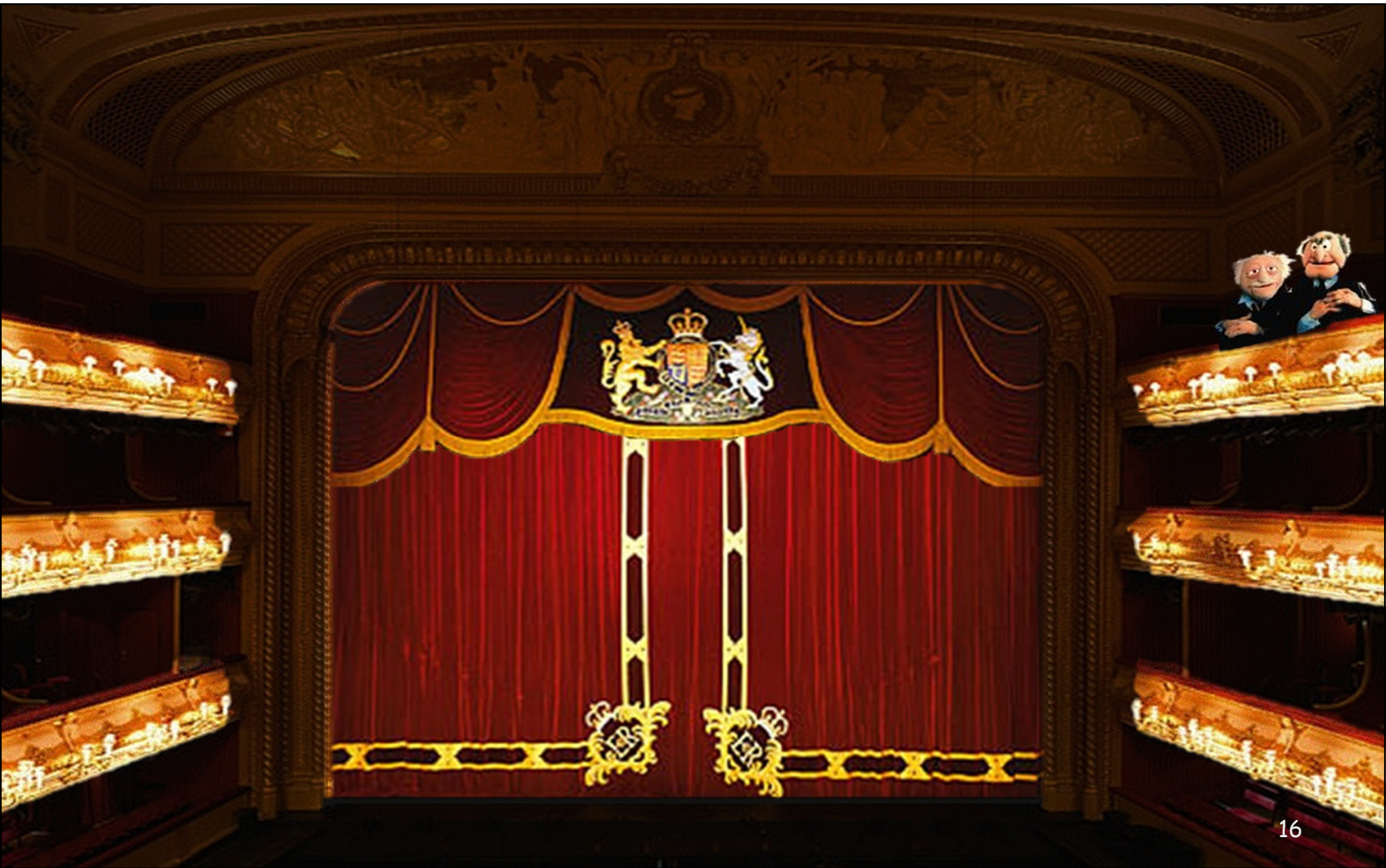
Lung tissue with asbestosis

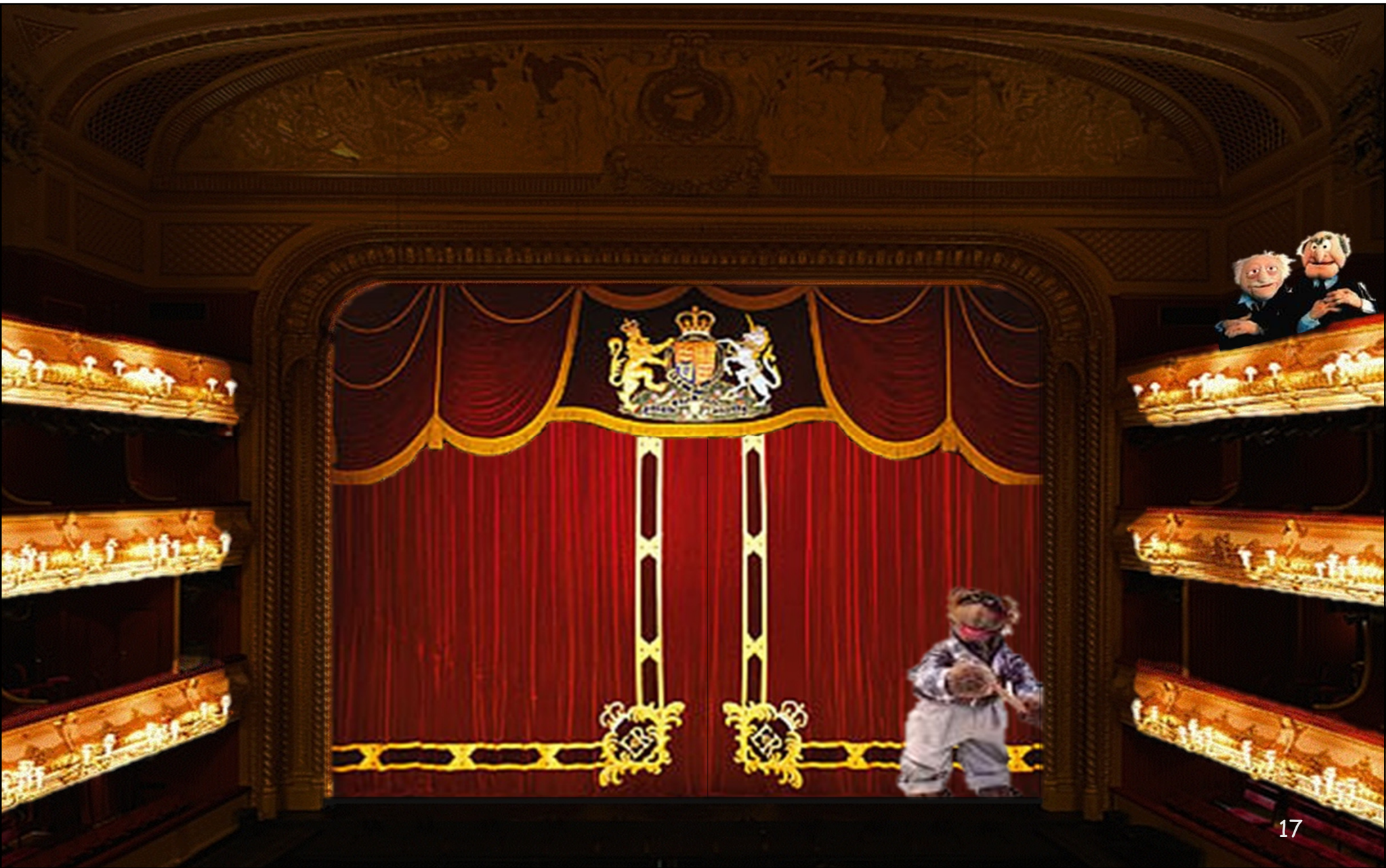


Lung Cancer Cells.



Mesothelioma Lung Cancer Cells



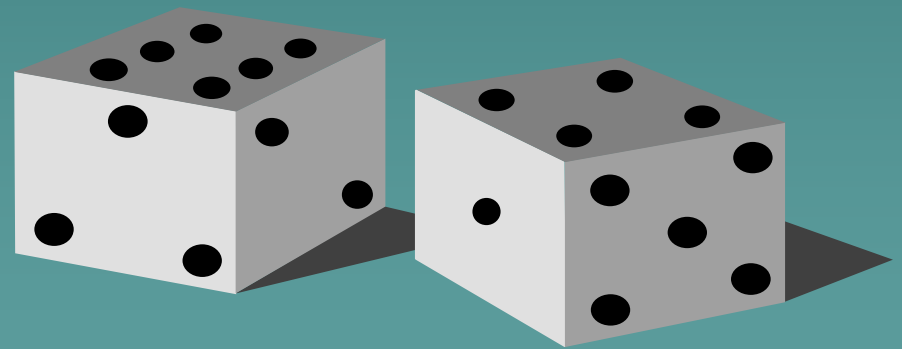




J-M manufacturing video clip

Factors that Determine Risk for Developing Disease

- ◆ Dose
- ◆ Duration of exposure
- ◆ Frequency of exposure
- ◆ Occupation
- ◆ Smoking status





2nd-hand exposure impact

Any Questions?



History of Asbestos Use



Asbestos Properties

- ◆ Durable
- ◆ High Tensile Strength
- ◆ Non-conductive
- ◆ Resistant to Corrosion
- ◆ Light weight
- ◆ Non-Biodegradable
- ◆ Non-combustible



"Asbestos" is the Greek word for "Inextinguishable" or "Indestructible"

End of Stone Age

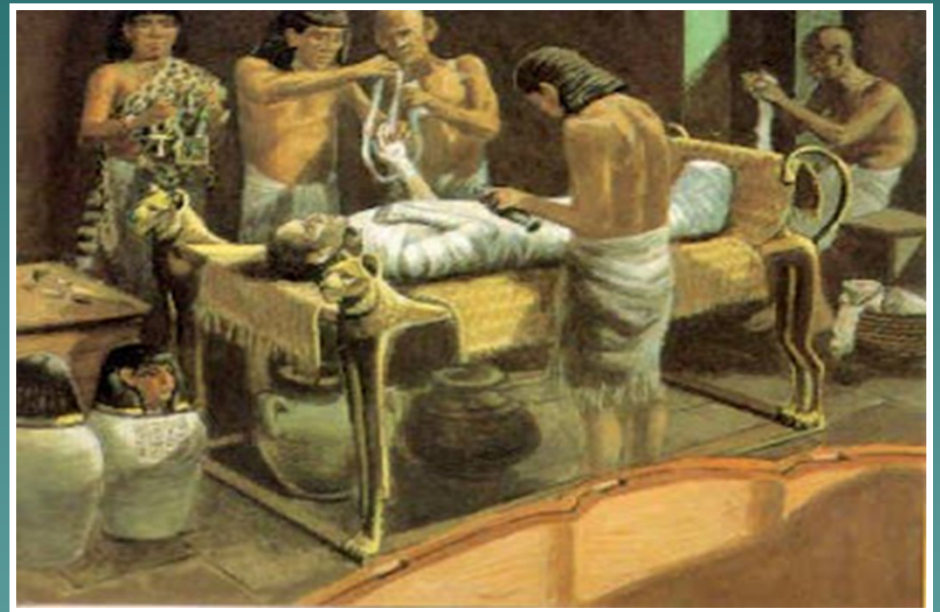
(6000 B.C. - 2000 B.C.)

- ◆ 4200 B.C. - 2000 B.C.
- ◆ Asbestos used to strengthen pottery found in Finland, Russia, Norway & Sweden
- ◆ "Comb-ware", named for decorative imprints in pottery made by hunter-gatherers in Finland/Norway



Egyptians

- ◆ Made asbestos clothing
- ◆ Embalmed pharaohs with asbestos



Greek & Roman Times



- ◆ Flame retardant cloth, building materials, women's clothing
- ◆ Throw in fire to clean
- ◆ "Don't buy quarry slaves. They die young."

Medieval Period / Middle Ages 5th - 15th Century A.D.



Asbestos used extensively as insulation in suits of armor.



Year 1095

First Crusade
knights reportedly
used catapults to
fling flaming bags
of pitch & tar
wrapped in asbestos
bags

Year 1280

Marco Polo, Venetian (Italy) merchant, wrote of Mongolian clothing "...which would not burn...", discovered on his epic 24 year journey to Asia/China & back.



Early Paper Products

Italy made asbestos paper in 1700s.
By 1800, it was used to produce bank notes



Asbestos Mining



Open pit mining methods

- ◆ Began 4000+ years ago
- ◆ 1st century A.D., quarry on Greek island of Evvoia
- ◆ 1879--First commercial mine, Thetford, Canada
- ◆ Thereafter, mining grew as demand increased.
- ◆ US, Russia, China, India, Brazil, South Africa ...

Nearby Asbestos Mining

Belvidere Mountain----Eden/Lowell Mills, VT
early 1900s - 1993



Asbestos Consumption

◆ 1879

- Commercial mining began
- 300 tons produced in first year

◆ 1930's

- 500,000 tons/year

◆ 1970's

- Peaked at 4 million tons/year

◆ 1980's

- Dropped to 217,000 tons/year due to new regulations and public health concerns



Eventually, Over 3000 Commercial Asbestos Products Manufactured



- ◆ Textiles
- ◆ Building materials
- ◆ Friction products
- ◆ Paper Products
- ◆ Insulation
- ◆ Packaging, gaskets, coatings
- ◆ Vermiculite
- ◆ Talc
- ◆ Others

Steam Locomotives

- ◆ Asbestos became a major component of insulation in boilers, fireboxes and pipes in steam locomotives.
- ◆ Boxcars, cabooses, refrigeration units, steam lines, brakes, clutches.



World War II

Asbestos Use Increased

- ◆ Common in ships
- ◆ 4.3 million pipe fitters, insulators and other shipyard workers
- ◆ 14 per 1000 died of mesothelioma
- ◆ Deaths due to asbestosis unknown





Wizard of Oz video clip

Asbestos Product Manufacturing in NH

- Meredith—*Amatex* (former Keasbey & Mattison)

- ◆ Asbestos cloth
- ◆ Ceased operation c. 1982
- ◆ Disposed of waste at town landfill

- Tilton--*Quinn-T*

- ◆ Asbestos paper products
- ◆ Ceased operation late 1980's
- ◆ Disposed of waste in on-site landfills

- Nashua—*Johns-Manville*

- ◆ Asbestos construction & industrial products (transite board)
- ◆ Ceased operation c. 1985
- ◆ Gave waste to area property owners for fill



Asbestos Waste in Nashua & Hudson *Legacy of J-M's Free Fill Policy*

- ◆ Dumped for 70+ years;
- ◆ Estimate over 400,000 tons
- ◆ Effecting over 300 properties
 - Residential
 - Commercial
 - Industrial
 - Institutional
 - Public Land







Asbestos in NH Bridges



- ◆ Used 1958 - 1978
- ◆ Found in membrane material, pavement, bridge shoes, backwalls
- ◆ 400 - 800 state bridges
- ◆ ??? town bridges

All the while, people working with asbestos were getting sick...

- ◆ A.D. 61-114: Quarry slaves were dying
- ◆ 1899: Detected "curious bodies" in lungs
- ◆ 1906: 1st autopsy documenting an asbestos related death
- ◆ 1918: Insurance companies began decreasing coverage for asbestos workers
- ◆ 1924: First diagnosis of asbestosis in UK--
Nellie Kershaw

Timeline con't...

Asbestos sickness awareness

- ◆ 1930: Dr. Cooke reported 66% of 20-year veteran asbestos workers had asbestosis
- ◆ 1931: First Asbestos Industry Regulations, requiring ventilation in the work place
- ◆ 1940s & 1950s: Documents show that manufacturers knew of this but chose to conceal it from employees
- ◆ 1970s: EPA began to regulate asbestos

Back to the Present...



Questions?

Some Common Products Containing Asbestos

- * *Vinyl Flooring - tile/sheeting, backing & mastics*
 - * *Boiler Pipe Insulation and Cements*
 - * *Transite Siding, Roofing and Pipe*
 - * *Asphalt Roofing Materials*
 - * *High Temp. Gaskets*
 - * *Caulking and Putty*
 - * *Joint Compounds*
 - * *Friction Devices*
 - * *Vermiculite*

Classifications

"FRIABLE"

Crumbled or pulverized under hand pressure



Classifications (cont.)

"NON-FRIABLE"

Can NOT be crumbled or pulverized under hand pressure



Friable Asbestos Poses Greatest Health Risk





Did You Know?

You can still purchase products
that contain asbestos!!!

Read The Product Labels!

May be labeled as containing "Asbestos"
or any one of the following:

☞ *Chrysotile*

☞ *Amosite*

☞ *Crocidolite*

☞ *Tremolite*

☞ *Actinolite*

☞ *Anthophyllite*

Vinyl Floor Tile



Ceiling Tile



Transite

A Cement and Asbestos Product



Roofing



Concrete or Asphalt Cements



Shingles



Insulation

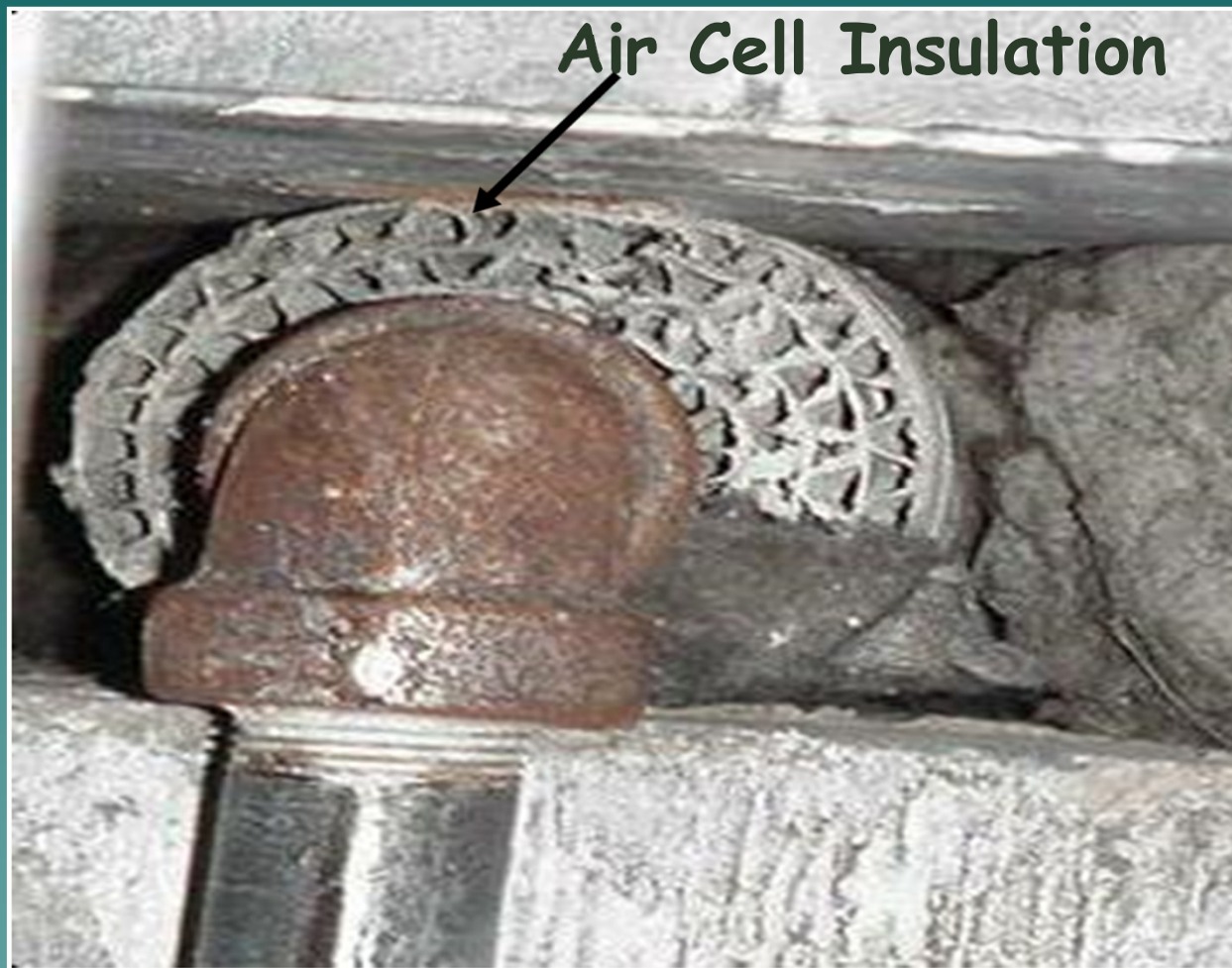


Flashing/Caulking

Furnaces and Boilers



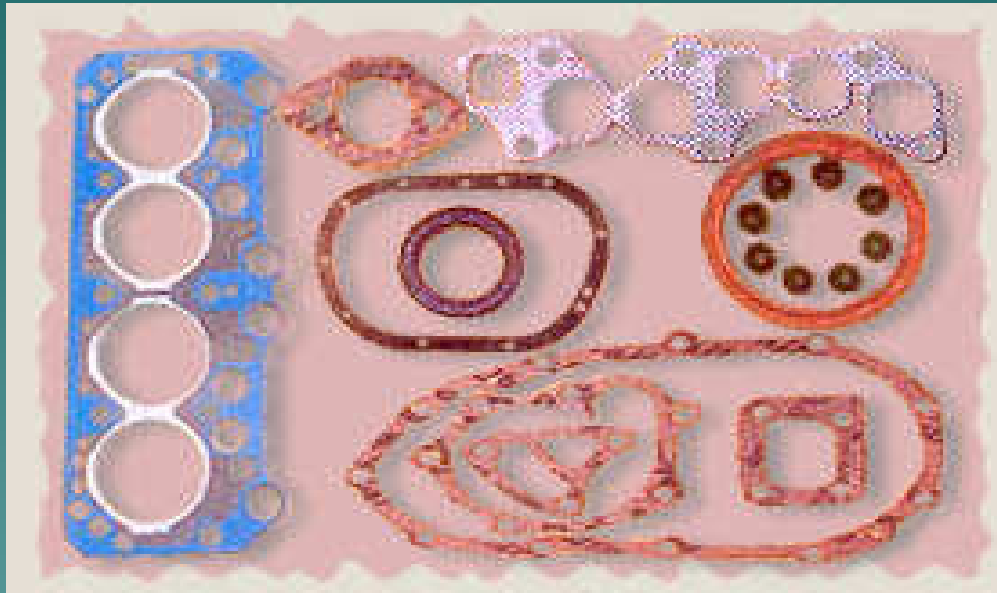
Pipe Insulation



Pipe Insulation



Automotive



Asbestos in the Waste Stream





Demolition/Renovation Projects

NHDES receives about 1,200 demolition/renovation notifications per year.



Demolition/Renovation Projects (cont.)

Town comparison (2013):

Town #1: Permits issued for 12 projects.
Processed 70 tons of C&D.
NHDES received 0 notifications.

Town #2: Permits issued for 51 projects.
Processed 540 tons of C&D.
NHDES received 0 notifications.

Town #3: Permits issued for 87 projects.
Processed tons of C&D not reported.
NHDES received 1 notification.

Some Helpful Questions

Ask the Resident/Contractor:

- *Where did the waste material come from?*
- *How old was the building from which the waste came from?*
- *Was an asbestos survey completed before beginning the demolition/renovation project?*
- *If so, was all asbestos properly removed and disposed of before bringing the waste to the transfer station?*

What To Do?

If you have any concerns:

- Do not accept the waste.
- Handout NHDES' Asbestos Brochure.
- Direct them to Contact NHDES for assistance.

Asbestos in the Waste Stream



Asbestos in the Waste Stream



Costly Disposal For A NH Town



\$\$ Guess How Much it Costs \$\$

<\$1,000

\$10,000+/-

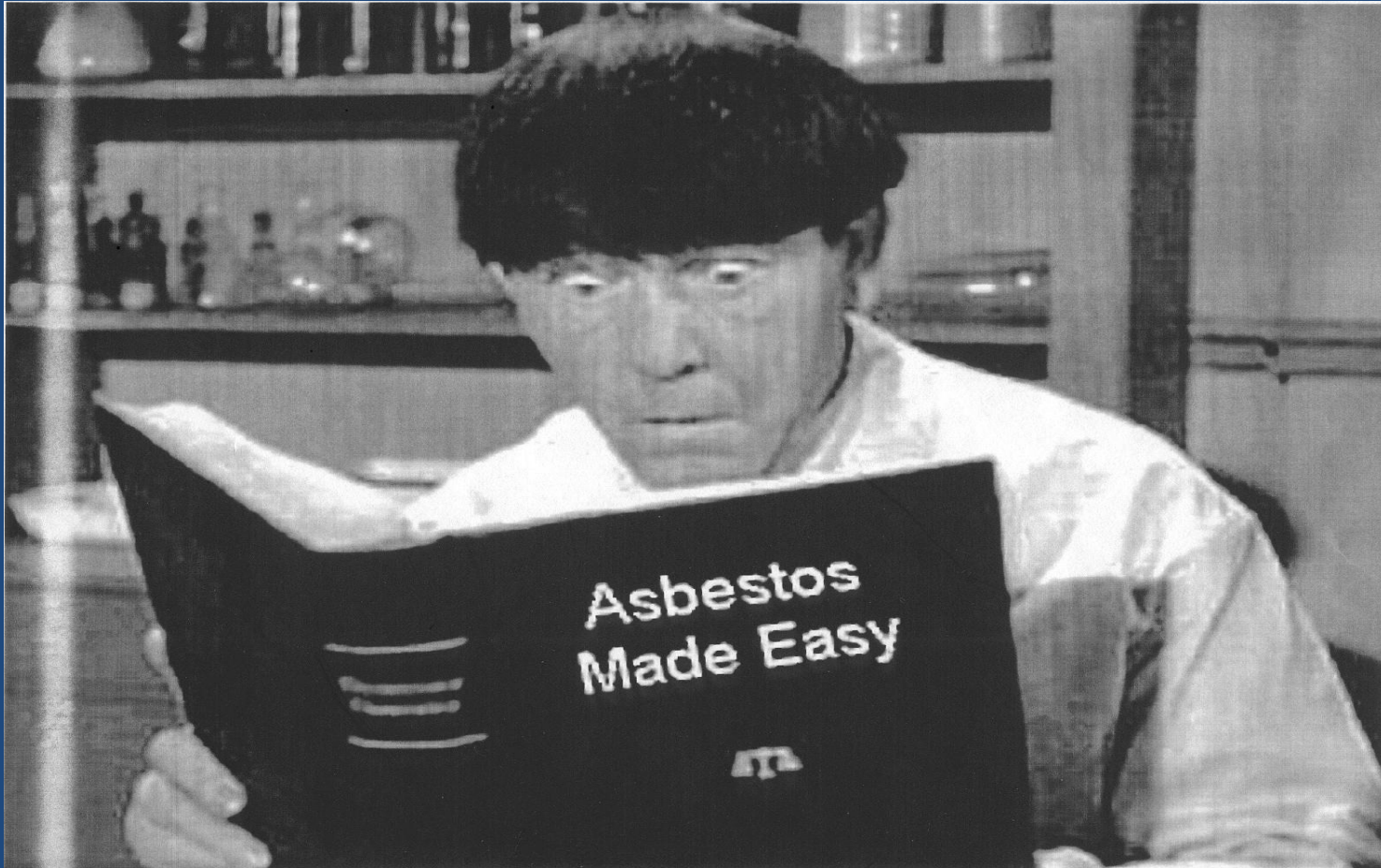
\$20,000>

Any Questions?



Break Time!

Asbestos Regulations



Regulation History

- **1932:** England, First asbestos industry regulations :
 - Ventilation
 - Made asbestosis an “excusable work-related disease”
- **About 10 years later:**
 - Similar legislation in U.S. about 10 years



Regulation History

- **1922:** U.S. Navy lists asbestos work as hazardous and recommends respirators
- **1940's:** ACGIH establishes exposure limit guidance
- **1969:** Federal contracts over \$10,000 must adhere to workplace standards
- **1971:** OSHA regulations take effect. EPA lists asbestos as a hazardous air pollutant



Regulation History

- **1973:** National Emission Standard for Hazardous Air Pollutants (NESHAP) enacted. Bans spray-on applications.
- **1975:** NESHAP bans many thermal applications



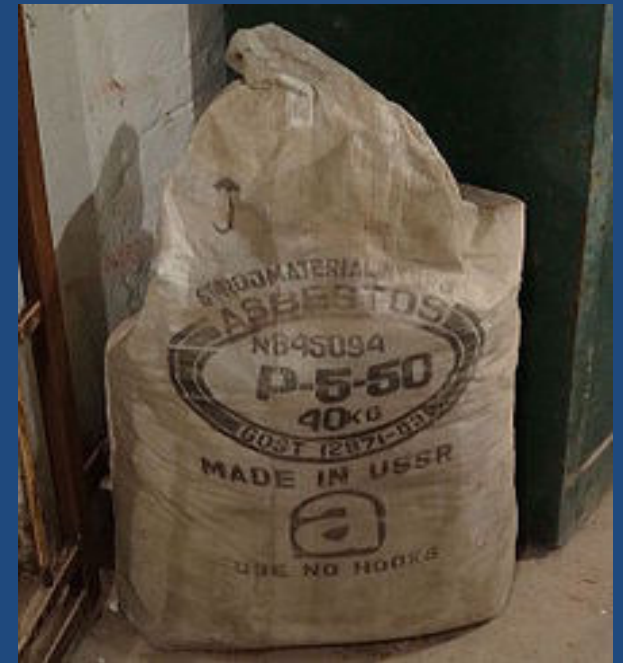
Regulation History

- **1970's – 1980's:** Continued adjustments to safe exposure limits, bans on certain products, and labeling
- **1982 – 1986:** EPA issues various regulations about asbestos in schools
- **1987:** EPA---Asbestos Worker Protection Rule, applying OSHA standards to government workers

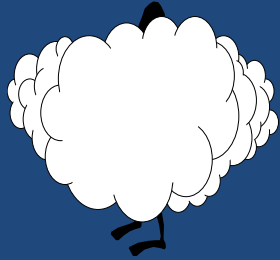


Regulation History

- **1989:** EPA promulgates Asbestos Ban and Phase-Out Rule
- **1991:** Much of the rule is overturned by U.S. Circuit Court of Appeals. Prohibition of new uses remains intact.



TODAY, asbestos is regulated as...



Hazardous Air Pollutant



Solid Waste

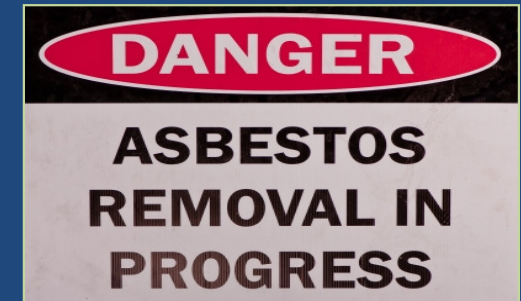


It is **NOT** regulated as a:

- Groundwater Pollutant
- Hazardous Waste

Four Key Areas of Regulation

1. Worker Protection
2. Removal from structures (“Abatement”)
3. Transportation
4. Disposal



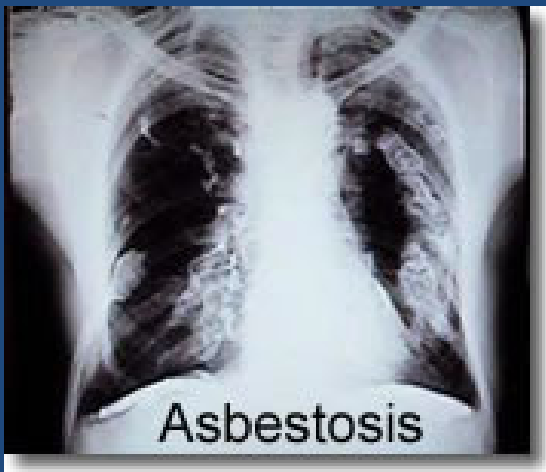
Worker Protection Requirements

Federal

- 29 CFR 1926.1101 (OSHA)
- 40 CFR 763 (US-EPA Worker Protection Rule)

New Hampshire

- Lab 1400 (NH Dept. of Labor)
- Env-A 1800 (NHDES ARD)



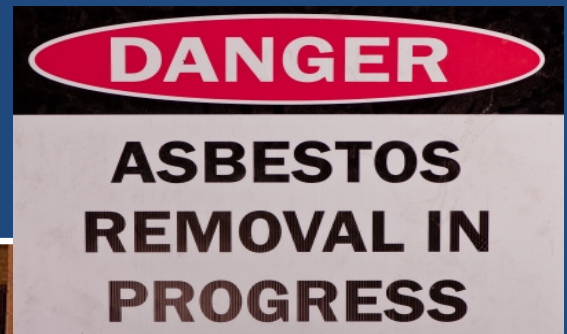
Worker Protection Requirements

1. Employers must train & protect their workers.
2. Workers must comply with employer protections.



“Asbestos Abatement” Requirements (removal from structures)

- Federal: NESHAP - 40 CFR 61
- State Law: RSA 141-E
- State Rules: Env-A 1800
 - Survey/inspect for ACM
 - Notify NHDES-ARD
 - Licensed Contractor
 - Trained/Certified Workers
 - Controlled Work Procedures
 - Air Monitoring
 - Decontamination
 - Recordkeeping



Homeowners can do their own abatement work...

- They must use the same work practices and properly package and dispose of the waste
- But...do they always?
- Be cautious about loads of demolition debris



ERROR: stackunderflow
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