

Are we willing to heed the lessons of the past?

*Using the Precautionary Principle
to foster safe innovation led
growth*

Presentation to the OECD Conference on Environmental
Benefits of Nanotechnology

by Steve Mullins

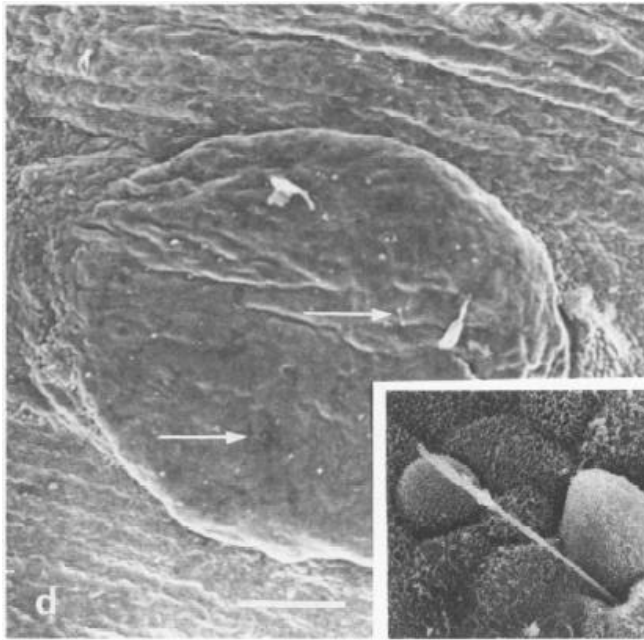
Australian Council of Trade Unions

State of Play

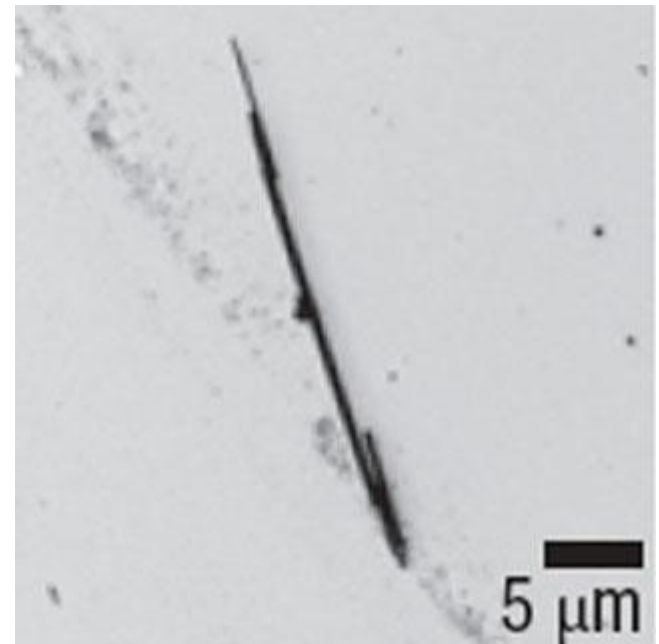
- Over the next decade, the global value of revenues related to nanotechnology is expected to increase from US\$32 billion to US\$2.6 trillion and governments and business are looking to stake their claim.
- Promoters claim nanotechnology will revolutionise the fields of medical and environmental science.
- Currently nanotechnology is used in about 800 consumer products and may eventually extend into every industry.
- But there are growing concerns about the health and safety impacts of nanomaterials on workers and consumers.

Health Impacts

- Asbestos Fibre

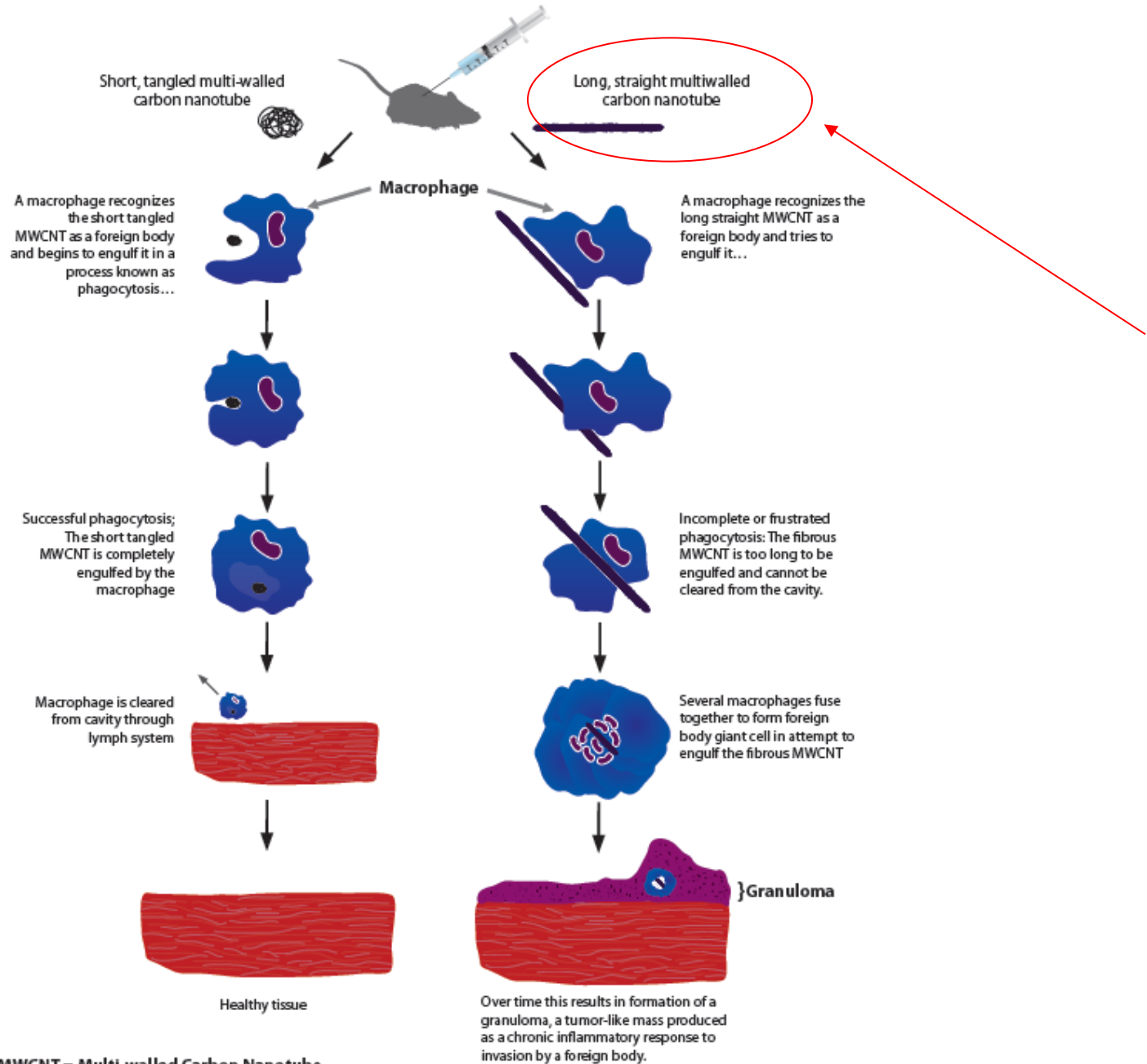


- Carbon NanoTube



Phagocytosis of Long, Straight and Short, Tangled Multi-walled Carbon Nanotubes

Not to scale



MWCNT = Multi-walled Carbon Nanotube

Produced by the International Council on Nanotechnology, Rice University.

ASBESTOS INTO FASHION PICTURE

Pink asbestos aprons for careworn ladies who lean on stores sized into the International Fashion Market today from Great Britain.

With them came striped asbestos table cloths for folks who don't like sah trays, and lavender asbestos patterns for pieces of hot potatoes. London manufacturers also produce red asbestos rags, on which bonfires may be built, and easy asbestos window curtains guaranteed to defy a blow torch.

C. G. Conannon, chief of the chemical division of the Bureau of Foreign and Domestic Commerce reported the Britishers had invented new methods of weaving asbestos fibers into cloth, and dyeing the result, like a bolt of woolen.

This fireproof fabric is being woven into all manner of everyday clothing and household furnishings, promising an immediate loss of business for the London fire department.

This hot news was received with cool calm by E. M. Aring, Washington representative of one of the world's biggest asbestos companies. He said his firm had been manufacturing asbestos for years these many years for those who sit on hot seats.

The only trouble with these heat-defying winter garments, he said, is the fact that they're a little scratchy, despite the best efforts of the scientists, and neutralize the wearing of cotton union suits. "They're not particularly pretty, either, he said, being a plain gray, but they're a big comfort to an engineer opening the door of a bus, furnace, or a dare-devil strolling into an oil well fire.

Aring said his company made gloves, mittens, leggings, helmets and complete suits of asbestos for workmen who labor in hot spots.

The latest product, competing with the best from England, is a brightly striped asbestos awning, for use on skyscraper windows. This awning foils the public enemy on the 50th floor who drops a cigar, and hangs over the sill, waiting for a laugh at the fire escapes below.

The pretty British asbestos is something new, all right, Aring admitted, but he said he found it would be a mighty hot day before it figures much in the news from Parisian fashion headquarters.

Asbestos fabric at best is rough stuff, like busrap, heavy like automobile brake lining, and licky, like everything. Aring said he'd thought probably it would be fine for a tablecloth at a poker game, but not so hot for a skirt, unless worn by a Hindu fakir just out of meditation and ashles.

One tip to the manufacturers, free, is the suggested production of asbestos shoes, to foil Jack Dempsey and other opponents of the "hot foot," a popular game now making life miserable for party-goers everywhere.

For the kiddies, there is equally attractive fall wearing apparel in local department stores, and, although you might not believe it, the kiddies are just as excited about new clothes as the grown-ups.

For little girls anything is good

that even has a suggestion of the Shirley Temple style. Fine broadcloths and silk prints are the most popular materials.

For little boys there are, 2-piece knits and for boys just a little older there are woadlets in a tailored coat and shorts trousers.

Increasing attention is being given to children's clothing by most department stores here.

Dressmaker Details In New Knits

Knitwear has taken a new lease on life! The casual, severely plain costumes which have become practically a uniform are taking a back seat since the introduction of the new Fall knits.

Dressmaker treatments have arrived in knits to make them as important as any silk frock. Pleats, puffs and flares are seen in skirts, and they are as graceful

as a cloud on a June day! Capes and sweater coats have made their bow. They are so warm and comfortable that a coat will not need to hide their beauty for a long while.

Tunics, too, have invaded the world of knits. They are dressy enough to be suitable for the most fashionable bridge parties in town.

When knits go tailored, they adopt new individuality. Skirts and blouses are contracted to give relief. Weaves are different in skirts and blouses. A new phase in tailored knitwear is the jumper, which is entirely suitable and very refreshing and youthful.

Perhaps you will wonder how all this is now possible in knitwear. Perhaps you may believe that with such historicity in style, the weaves will be bulky. But that is where the difference lies. Weaves are often as fine as silk. Because of their very supple designs are not limited to their creation in styles.

Loose weaves for dressy knit frocks have been replaced by a more firm, yet equally soft and delicate weave.



COATS

of smooth, rich fabrics have luxurious, flattering fur trims... and their princess lines are high style.

WE PRESENT A HUGE SELECTION

\$16.95 TO \$79.50

Sport Coats **\$10.95 to \$38.50**
Fall Suits **\$16.95 to \$79.50**

Bernard's

"Chichest's Smartest Women's Shop"



FALL FROCKS

of Crepes, Woolens and Velvets

\$4.95 To \$29.95

Junior Sizes 11-17, Misses 12-20, Women's 36-46

Behold the new fashions! Like works of art in a gallery, each has a distinction all its own. Everything points to a dramatic, all-star fashion picture!... Get into it!



MILLINERY

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Beauty and Bows

Velours, Velvets and Fells in new rich, Fall colors. All headsizes

Bernard's
Calliope's Smartest Women's Shop

For Fall Fashions

Potential Worker Exposures/Hazards

The following workplace tasks may increase the risk of exposure to nanoparticles:

- working with nanomaterials in liquid media without adequate protection (e.g., gloves) will increase the risk of skin exposure.
- working with nanomaterials in liquid during pouring or mixing operations, or where a high degree of agitation is involved, will lead to an increase likelihood of inhalable and respirable droplets being formed.
- generating nanoparticles in the gas phase in non-enclosed systems will increase the chances of aerosol release to the workplace.
- handling nanostructured powders will lead to the possibility of aerosolization.
- maintenance on equipment and processes used to produce or fabricate nanomaterials or the clean-up of spills or waste material will pose a potential for exposure to workers performing these tasks.
- cleaning of dust collection systems used to capture nanoparticles can pose a potential for both skin and inhalation exposure.
- machining, sanding, drilling, or other mechanical disruptions of materials containing nanoparticles can potentially lead to aerosolization of nanomaterials
- depending on their composition and structure, some nanomaterials may initiate catalytic reactions and increase their fire and explosion potential that would not otherwise be anticipated from their chemical composition alone

Precautionary Measures Promoted in Reports

- minimize worker exposures ALARP
- control of airborne exposure using engineering control techniques
- risk management program assessing potential worker exposure to determine the degree of risk.
 - the education and training
 - installing and evaluating engineering controls (e.g., exhaust, ventilation)
 - personal protective equipment (e.g., clothing, gloves, respirators, filters, facemasks, sticky mats)
 - the systematic evaluation of exposures
- Cleaning of work areas using HEPA vacuum pickup and wet wiping methods, preventing the consumption of food or beverages in workplaces where nanomaterials are handled, and providing hand-washing facilities and facilities for showering and changing clothes.
- Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures.
- There are a number of ventilation/ exhaust systems being tested

Worker Protections

Big Problems Protecting Workers From Small Hazards

- No regulatory acceptance that nanomaterials are more hazardous
- No nano specific risk assessment or controls mandated
- No nano specific monitoring equipment
- No nano specific MSDS
- No exposure levels
- No labels
- No requirement to inform
- No health surveillance
- No training
- No nano specific PPE
- **Where nano specific risk management applied or promoted, end up trying to apply controls designed for larger material anyway**
- **There is no coordinated approach**

“Presently, quantitative health hazard and exposure data are not available for most nanomaterials.

Therefore, health risk evaluation for the workplace currently relies to a great degree on professional judgments for hazard identification, potential exposures and the application of appropriate safety measures.”

(Conclusions – Ch. 6 - Risk Assessment in Occupational Settings –
“Health and Safety Practices in Occupational Settings Relevant to nanotechnologies” – ISO TC 229 Technical Report)

Principles for the Oversight of Nanotechnologies and Nanomaterials for Safe Innovation Led Growth

The Principles

I. A Precautionary Foundation

II. Mandatory Nano-specific Regulations

III. Health and Safety of the Public and Workers

IV. Environmental Protection

V. Transparency

VI. Public Participation

VII. Inclusion of Broader Impacts

VIII. Manufacturer Liability