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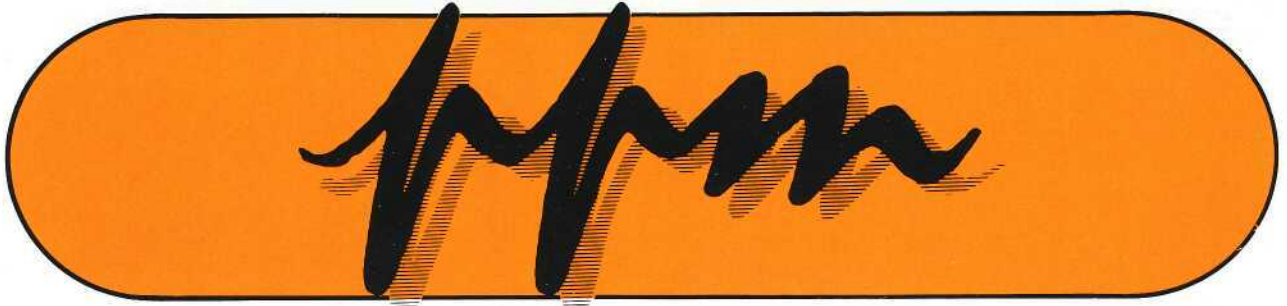
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professional protection magazine

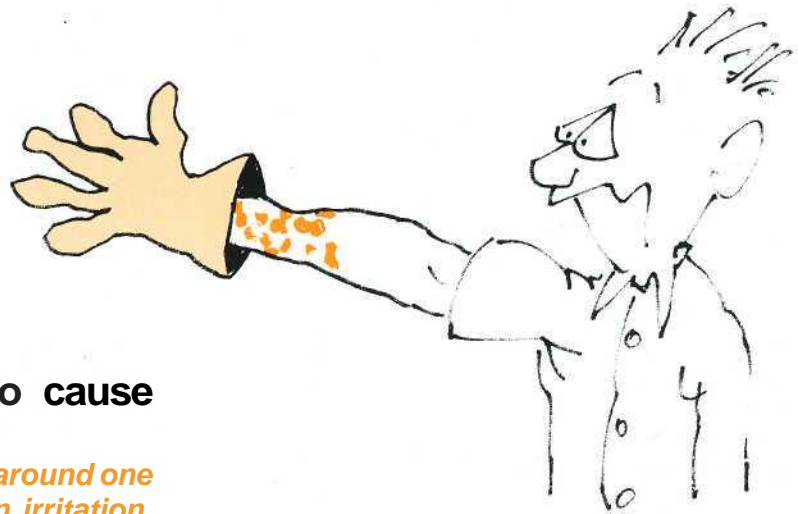
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Rub-rub-rubber irritation



Natural rubber found to cause skin problems

A recent study has shown that around one third of people experience skin irritation, such as rashes and eczema, when wearing natural rubber gloves. The study, covering 233 people, revealed a number of reactions, spanning from slight irritation to eczema, hayfever and persistent itch.

The reactions are probably caused by allergy to proteins in the sap of the rubber tree — not sensitisation to chemicals.

People who suffer discomfort when wearing natural rubber gloves should try plastic gloves instead. However, make sure that the plastic gloves provide the required protection. If rubber gloves must be used, wear thin cotton gloves or plastic gloves inside the rubber glove.



Source: Arbetsmiljo 7/92 p7

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Let's Come Clean

Cleaning work — so routine it's unsafe

Building maintenance is a very large, very important industry. But when it comes to chemical safety, the cleaning cupboard is often forgotten.



It is possible that a look into how companies take care of their cleaning chemicals in Australia would show the same terrifying results as a recent survey in Scandinavia.

In that presumably safety-conscious part of the world, around 60% of cleaning companies had no inventory of their chemicals, 50% were not aware of any hazardous chemicals legislation, and 40% had no idea of the characteristics of their detergents, since they had no product information.

In about half of the companies included in the survey, staff had never been informed of the meaning of warning labels and safety symbols.

Here are some guidelines for both employers and employees in professional cleaning companies:

Employers

- Buy cleaning chemicals from reputable dealers
- Make sure all product information is available
- Ensure that all containers are correctly labelled
- Become familiarised with current guidelines, codes of practice, hygienic limit levels, safety recommendations etc. for all chemicals used
- Inform all employees of the importance of correct handling and application techniques
- Ensure that the correct personal protection (gloves, respirators etc.) is available, if required

Employees

- Know the chemicals, and how to use them
- Use gloves, if possible
- Take care of the skin: use skin cream
- Never make "concoctions" of various chemicals
- Use eye protection when there is a risk of eye splashes
- Wear proper shoes: chemicals have been known to saturate shoes and affect the feet, even to the point of losing the toes
- Always keep containers tightly closed
- Never use chemicals in containers with missing or illegible labels

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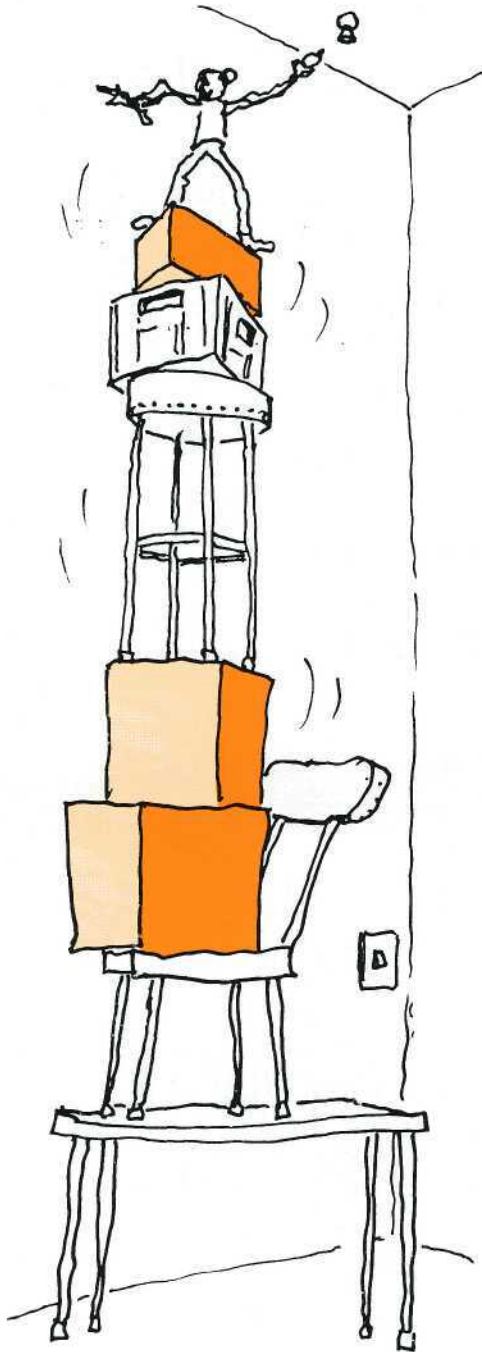
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Source: Jill Klackenberg, Tema Stadning, Arbetsmiljo 1993

Handy hints



Never use boxes, chairs or other makeshift substitutes for a proper ladder.

CHEMICAL FACTS:

Aluminium

- Other names:** Aluminum (U.S.)
- Characteristics:** Silver-white metal, powder or dust.
- Odour:** Odourless
- Aust. TWA:** 10 mg/m³ (dust)—5 mg/m³ (welding fume)
- Fire:** Fire and explosion risk if dispersed (dust explosion) or if in contact with strong oxidants. Reacts with water, acids and alkalis, forming hydrogen.
- Inhalation:** Irritation to mucous membranes. Lung damage possible due to chronic exposure.
- Skin contact:** Inhibits healing of wounds.
- Eye contact:** Irritates mucous membranes.
- Ingestion:** N/A
- Prevention:** Good ventilation, Floors should be joint free and kept clean. Washing facilities should be available. Keep away from electrical appliances, open flame, sparks and heat sources. Keep areas and machinery clean. Vacuum dust. Keep areas free of moisture. Keep containers securely closed. No smoking, no welding if aluminium powder is present. Keep away from water, acids, alkalis. Keep away from lead, copper, nickel, mercury, silver, zinc, soda, lime bromine, chlorine, iron chloride, iodine and oxidising substances. No eating or drinking in work area. Wash face and hands with plenty of water and soap.



Source: Merkblätter gefährliche arbeitsstoffe

When the pressure builds up...

High pressure water can be sharp as a knife

An accident can happen easily — even when comprehensive safety measures are taken, as demonstrated by this unfortunate story.

Three men from a sanitation company were cleaning a tank, using a portable high pressure water gun, fed by a pump on a truck. The first man handled the water gun; the second operated the pump; the third one supervised the cleaner and was equipped with an emergency cut-off switch.

The water gun itself was equipped with a dead-man's-grip which would cut off the water beam immediately if released.

The cleaner was wearing extensive protective equipment, such as a hard hat with a face shield, complete chemical protective suit and boots with steel toe reinforcements.

Cleaning with pressure guns can be exhausting work, since the rebound from the water beam can be great. In this case, the worker was also forced to work in an uncomfortable position and in a small space; the ceiling of the tank was only one meter high. It was also hot and dark inside.

The three men swapped duties in one-hour shifts. The water pressure was around 300 bar.

Suddenly, the cleaner, who was standing on one knee, dropped the front handle of the water gun, which recoiled so quickly that the other hand which held the dead-man's-grip never had time to release the switch.

The water beam cut through the worker's boot behind the steel toe reinforcement and amputated his big toe.

In this instance, it may be hard to find a fault in the set-up and work practices. Perhaps a lower water pressure should have been tried out first. A pair of boots with full Kevlar reinforcement may also have prevented the injury. And full one-hour shifts in the uncomfortable position may have been too long.

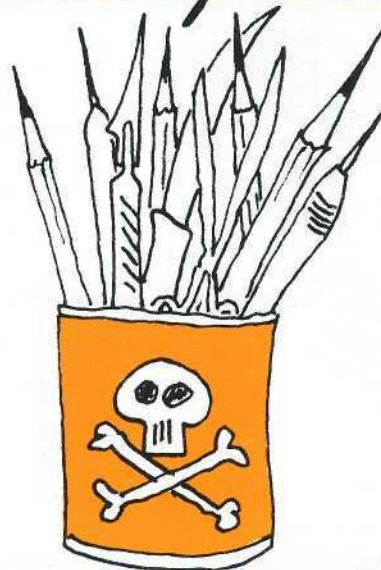


300 bar is a very high water pressure. However, even home hobby pressure guns produce water pressures that can cause injuries. Great care should be taken when working with pressure water guns of all types. If the water hits a person's face, the eyes are very much at peril.



Source: Swedish Work Inspection, reported by Arbetsmiljö, 2/93p25

Handy Hints



When storing pens, pencils, letter openers and scissors in pen holders, turn them with the sharp end DOWN to avoid accidents

Asbestos removal & skin protection

An itchy question

Asbestos removal is an area which, because of its hazards, is tightly regulated in Australia and overseas. The Worksafe code of practice and guidance notes for asbestos is a rather comprehensive document. However, one of the areas not covered by such a document is the skin discomfort and irritation caused by the personal protection equipment worn by asbestos removal workers.

Perspiration

One of the main disadvantages of all protective equipment, such as work suits, face masks, gloves and boots, is the excessive perspiration.

The sweating is not a problem in itself. The problem is that the airtight protective clothing does not allow the perspiration to evaporate. This causes the skin to re-absorb the perspiration, resulting in *skin maceration*, or softening of the outermost layers of skin.

Washing

Another problem is excessive washing. The very nature of asbestos removal requires frequent cleaning of the entire body. This frequent washing can put even more strain on the skin.

What to do:

• Maceration:

Use a high quality skin protection cream that contains tannin. Tannin-based skin creams have a strengthening effect on the outer layers of the skin, and will minimise the reabsorption of perspiration.

Within minutes after application of the cream, the effects can be noticed: the skin takes on a matt quality and feel.

m Washing:

Use mild shampoos and non-aggressive skin cleaning products with a pH level that is com-



patible with the skin. Ordinary soap is not perfectly compatible, and could interfere with the skin's natural protective characteristics.

*Some skin preparations contain **betaines** and **sulphosuccinates**, which belong to the ten-side family of surface active substances which are gentle to the skin.*

■ After work:

Use a well-balanced after-work cream of the water-in-oil type with a high fat content. It is important to make sure you're using a water-in-oil preparation: oil-in-water types have a high water content, and much less regenerative effects. This helps the skin to prepare itself for the next working day.



Source: Stockhausen, Krefeld, Germany

**Protection not worn
equals
Protection factor NIL!**

FOUR FATAL FACTORS

that could cause an accident

1: Lack of knowledge

- Can't understand instructions
- Hasn't been given correct instructions
- Unaware that the work procedure was unsafe
- Insufficient skills, not enough practice

2: Poor attitude

- Disregarding instructions on purpose
- Doesn't believe that work practice is unsafe
- Carelessness
- Absentmindedness, daydreaming, seeking distraction

3: Medical conditions

- Poor vision
- Poor hearing
- Easily fatigued
- Hernia
- Heart conditions
- Nervousness
- Using drugs or alcohol

4: Safe conduct impossible

- Emergencies
- Safety equipment temporarily missing or faulty
- Safety equipment unavailable



Confined Space

Defined Space

We have published several articles about the hazards of confined spaces and the methods of entering them. But what really IS confined space? American OSHA has put pen to paper and provided a precise description of confined space.

A new OSHA standard came into force in the United States in April this year. It is hoped that the new standard will cut the fatalities that occur every year in the US by as much as 86 per cent, as well as around 5,000 lost workday injuries.

Although OSHA's figure is 63 fatalities per year, other experts estimate that up to 300 US workers die in confined spaces every year.

The OSHA standard covers boilers, storage tanks, furnaces, manholes, railroad tanks, pits, cooking and processing vessels in the general industry, and will affect some 240,000 workplaces.

The standard will require employers to *document* and *control* each entry into a confined space.

But what defines a confined space? According to OSHA's new guidelines, a confined space is any space that:

- is large enough and so configured that an employee can bodily enter and perform assigned work
- has limited or restricted means for entry and exit
- is not designed for continuous employee occupancy

Confined spaces are further divided into two groups, called *permit-required* and *non-permit* spaces. Confined spaces where a full entry permit is required for each entry have one or more of the following characteristics:

- The space contains or has the potential to contain a hazardous atmosphere, including oxygen deficiency, oxygen enrichment, toxic gas and flammable/combustible gas.
- The space contains a material that has the potential for engulfing a person (such as sand, grain etc.)
- The space has an interior which could trap a person or asphyxiate a person by inwardly



converging walls or by a floor which slopes downwards and tapers to a smaller cross section

- The space contains any other recognised serious safety and health hazard, such as electrical hazards

Consequently, non-permit confined spaces are places which do not contain any real or potential hazard capable of causing death or serious harm.

OSHA officials are confident that simply by defining and identifying their confined spaces, employers will make a great improvement to their workplace safety.



Source: Gregg LaBar, Occupational Hazards, Cleveland, Ohio, March 1993

**Education is good
Understanding is better!**

*Training is silver...
Attitude is gold!*

Tungsten = Asbestos?

Tungsten oxide fibre may cause cancer. The fibres have all the characteristics that signify cancer-causing fibres.

Tungsten oxide fibres are thin, long, crystalline and insoluble. They are suspected of causing the same type of damage to DNA molecules as does blue asbestos, according to professor Staffan Krantz at the aerosol unit of the Solna Institute of Work Environment.

A new, incisive research program is currently underway to explore the connection between tungsten oxide fibre and a number of lung diseases.

Hardened metal of the type used in saws, knives and other cutting tools is made through a metallurgic process involving tungsten carbide and cobalt, among other materials. During the first production step when tungsten trioxide is transformed to metallic tungsten, fibres of tungsten oxide (known as "whiskers") are formed. This process takes place in high temperature ovens.

The formation of tungsten oxide in the process has long been known to chemistry professionals. However, it may not have been a known fact to occupational hygienists.

The end product, metallic tungsten, is a substance which does not readily react with other materials. The formation of an occupational health hazard during the production process may not have occurred to people in the industry, according to professor Krantz.

Researchers have begun to examine the presence of tungsten oxide fibre in the air at Sandvik, a well-known manufacturer of cutting tools. Since the 1950s, Sandvik employees have had a greater incidence of lung cancer than the average, although the reason has not been established.

Tungsten oxide fibres have the same hydrolysing capacity as blue asbestos. The research team has been funded for a two-year study to examine the structure of the fibres and the way in which they are spread in the air.



Source: Forskning pagar 2/1993, referring to Sahle W., Chest 102 (1992) 1310

CHEMICAL FACTS

Acetic acid 90-100%

Other names: Glacial acetic acid, Methane carboxylic acid, Ethanoic acid, Vinegar acid

Characteristics: Colourless liquid

Odour: Sharp, stinging vinegar odour

Aust. TWA: 10ppm (25 mg/m³)

Fire: Emits flammable vapour, May form explosive mix with air. Forms hydrogen in contact with metals (e.g. iron, zinc, but not aluminium).

Inhalation: Soreness in nose and throat, Coughing and hoarseness, High concentration can cause lung oedema, which may not occur until several hours after exposure, Extended exposure may cause inflammation to the nose and throat, chronic bronchitis and corrosive damage to the teeth.

Skin contact: Severe corrosive damage. Repeated and extended exposure may cause callosity and hardening of the skin,

Eye splashes: Intense pain. Corrosive damage. Great risk of permanent eye damage. Vapour causes strong irritation.

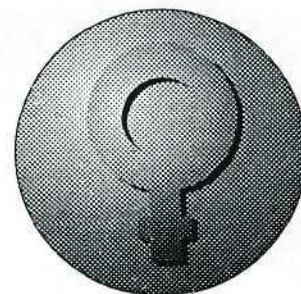
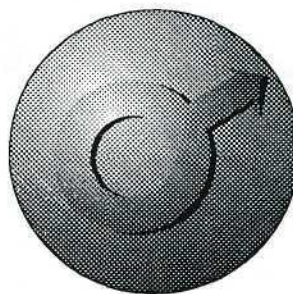
Ingestion: Severe corrosive damage. Burning pain, vomiting, Shock. Kidney damage possible, Risk of permanent health conditions due to scarring in throat and stomach.

Prevention: Good ventilation. Vapour may gather at floor level and in low-lying areas, Keep containers securely closed. Avoid any direct contact. Emergency showers and eye rinse stations should be available, Use goggles and gloves, Respirator may be required,



Source: Skyddsblad

Women lead? Men lead?



The Swedish Work Safety Directorate has taken the extraordinary step to issue two separate lead exposure levels for men and women.

The new legislation will come into force in 1994. From then on, the exposure level for lead in the bloodstream will be 1.5 micromol/litre ($\mu\text{mol/L}$) for women and 2.5 $\mu\text{mol/L}$ for men. The current regulation requires that both men and women will be removed from their work if their blood lead level exceeds 3.0 $\mu\text{mol/L}$.

The Work Safety Directorate believe that this decision could lead to separate gender-based exposure levels for a number of substances.

Employment restrictions

The decision has already had some serious consequences in the industry. One company has instituted an employment policy which precludes women under 50 years. The 35 women currently employed by the company have received notices that they could be removed from their work within a year unless their blood lead levels drop.

The ultimate result will probably be an all-men workforce in the lead handling operation.

Swedish companies have the rest of 1993 to adjust manufacturing and handling methods, protection equipment, ventilation, and hygiene in order for women to be able to work there.

The authorities are concerned that women may find it harder to find work under the new legislation, but are counting on cooperation from companies in order to lower lead concentrations.

Health effects

Abdominal pain (lead-induced colic) is a well-known effect of lead exposure since long ago.

Today's researchers are also talking of damage to the nervous system, kidney damage, and harm to the unborn child in women.

The most common fields of lead exposure are lead smelters, battery factories and lead alloy foundries. Battery factories employ the most women.

European Community

Only Germany has separate exposure levels for men and women, at about the same levels as Sweden. The European Community has a much higher level: 3.4 $\mu\text{mol/L}$ for both men and women.



Source: Eva Dahlgren, Arbetsmiljö 1/3p8

**It's not the chemical
that's unsafe:
it's the method!**

**Dangerous methods
are a bigger problem
than dangerous chemicals!**

Aluminium:

Is the exposure limit too high?

New findings have shown that the exposure limit for aluminium dust should be less than 5 mg/m³ in order to avoid effects on the lungs. To lessen the risk of asthma and effects on the central nervous system, the limit should be kept under 1 mg/m³, according to research provided to the Nordic Expert Group of Threshold Limit Value documentation.

High concentrations of aluminium occur primarily in welding operations, manufacture of aluminium powder, and purification of corundum and cryolite.

Aluminium is produced from bauxite, and is used in alloys together with copper, manganese, zinc, and other metals.

The metal is used extensively in motor vehicles, building materials, aviation, packaging, kitchen utensils and many more. Aluminium is also used in paint, food, insulation materials, Pharmaceuticals, cosmetics and abrasives. Aluminium sulphate is added in the treatment of drinking water and sewage.

Aluminium has long been regarded as a harmless metal. However, exposure to aluminium shows up in blood and urine traces. Some of the metal disappears quickly, while some is accumulated in the body.

Inhalation

Aluminium can be absorbed through inhalation, although the ratio of absorbed aluminium is not known. The highest blood and urine concentrations have been found among welders and people handling aluminium flake powder. Potroom asthma is a well-known disease among workers in the aluminium electrolytic production industry. Aluminium salts are associated with asthma: for instance, five out of seven workers experience asthma or bronchial hyperactivity when exposed to potassium aluminium tetrafluoride in concentrations around 1 mg/m³.

Ingestion

Aluminium can also be absorbed in the stomach, for example by people who take large doses of antacids containing aluminium.

Liver

Pulmonary disease is not the only concern. Aluminium accumulates in the liver dur-



ing repeated exposure. Animal research shows that kidney damage is also possible. Some research points to effects on the blood forming organs similar to those of lead poisoning.

Bones

Aluminium can also cause *osteomalacia*, a bone disorder that occurs most commonly among dialysis patients, but which can also affect people who take aluminium-containing antacids. In dialysis patients, aluminium could cause joint and muscle pain, since the problems disappear after aluminium treatment is discontinued.

Central nervous system

Aluminium has been shown to cause damage to the central nervous system, such as speech and language disorders, tremor, epilepsy, personality changes and intellectual deterioration. Several studies of workers in aluminium smelters and foundries have pointed to intellectual problems, uncoordinated muscles and other conditions.

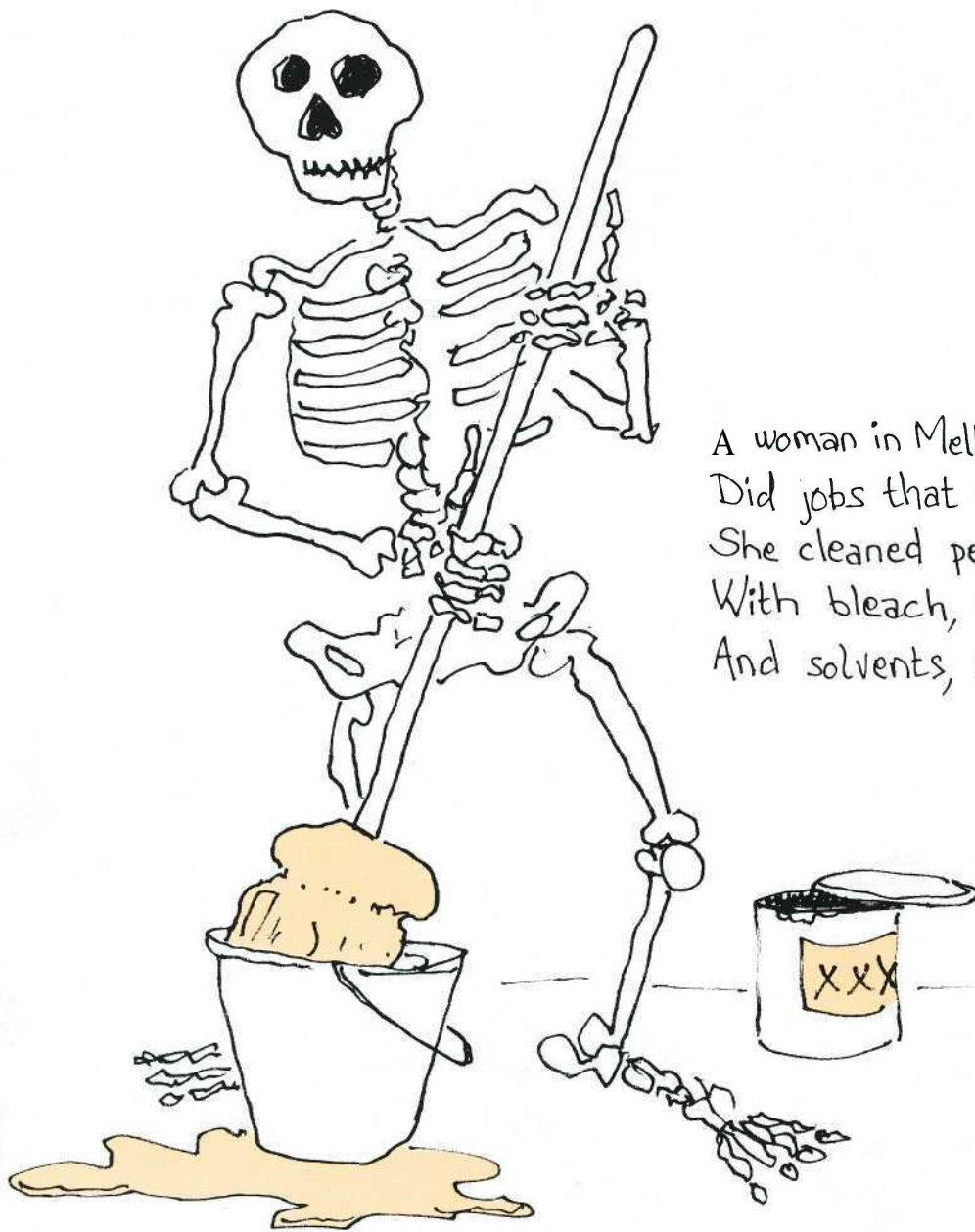
Workers who have been given aluminium powder to counter silicosis have shown signs of lessened intellectual capabilities. Lack of concentration and other effects on the central nervous system have been observed in welders who have been working with aluminium.

Contact with aluminium compounds may also result in asthma and other respiratory conditions, and some studies suggest that the conditions do not disappear when exposure to aluminium is terminated.

The leaders of the research team, Bengt Sjogren and Carl-Gustaf Elinder, conclude that undesirable effects may occur at concentrations below 1 mg/m³. The specialists suggest that to be on the safe side, exposure to aluminium powder should be kept under 5 mg/m³ in order to avoid aluminosis of the lung.



Source: Sjogren B., Elinder C-G: Aluminium - Arbeta & Hals 45 (1992)



A woman in Melbourne's St Kilda
Did jobs that really fulfilled her:
She cleaned people's homes
With bleach, suds and foams
And solvents, which finally killed her.

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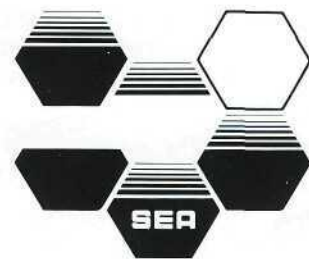
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