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IMPORTANT

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Should respirators be disinfected?

Routine decontamination of respirators could be an important consideration for industries, according to American researchers.

At the 6th conference in Tokyo of the International Society for Respiratory Protection, US researchers James J. Johnson and Richard L Stein presented the opinion that there may be a strong need for routine respirator decontamination, depending on the workplace and the workforce,

According to the researchers, blood-borne pathogens (disease-producing organisms) present a significant occupational health risk for respirator users, and employers should ensure that the risk of exposure to these pathogens is minimised.

The researchers claimed that communicable diseases which can be passed from a contaminated person include the following:

AIDS/HIV	Measles
Chickenpox	Meningitis
Diarrhoea	Mononucleosis
German measles	Mumps
Hepatitis A	Herpes simplex
Hepatitis B	Influenza
Hepatitis C	Tuberculosis
Hepatitis D	Whooping cough

Respirators can be cleaned in many ways, including **sterilisation** (a physical or chemical procedure to destroy all microbial life), **disinfection** (a procedure which inactivates almost all recognised pathogenic micro-organisms, but not necessarily all microbial forms, such as bacterial spores or inanimate objects), **general cleaning** (the physical removal of dirt), and **decontamination** (the reduction and prevention of the spread of contamination from person to person by chemical and/or physical processes).

When selecting a disinfection process, it is important to understand that not all processes achieve the same result. Generally, the processes can be described as environmental, low, medium or high level disinfection.

None of the disinfection processes can remove large numbers of bacteria in spore form. However, high-level disinfection destroys almost everything else,

Decontamination methods

Depending on the desired level of decontamination, the method is more or less complex and, in the case of sterilisation, can take up to 10 hours.

- **Sterilisation**

Steam under pressure, ethylene oxide, dry heat or immersion in a chemical sterilant for prolonged periods of time (6—10 hours)

- **High-level disinfection**

Hot water pasteurisation (80—100° for 30 minutes) or exposure to a chemical sterilant for shorter times (10—45 minutes)

- **Medium-level disinfection**

Exposure to "Hospital disinfectant" chemical germicides with tuberculocidal activity, commercially available hard-surface germicides or solutions containing at least 500 ppm free available chlorine

- **Low-level and environmental disinfection**

"Hospital disinfectants" with no claimed tuberculocidal effects

Effectiveness

Both the choice of disinfectant and its concentration are crucial, since the result can vary greatly. Common disinfectants include the following:

- **Isopropyl alcohol**
- **Hydrogen peroxide**
- **Formaldehyde**
- **Quaternary ammonium compounds**
- **Phenolic**
- **Chlorine**
- **Iodophors**
- **Glutaraldehyde**

Only hydrogen peroxide (3% — 25%) and glutaraldehyde (2%) are chemosterilisers. Only these, along with chlorine, can achieve high-level disinfection. 2% glutaraldehyde kills vegetative bacterial in less than a minute, and viruses in less than 10 minutes. However, bacterial spores may take up to three hours to kill.

Which method?

The chemicals and decontamination techniques outlined above may be more or less suitable for respirator cleaning, The researchers, Johnson and Stein do not recommend sterilisation or high-level treatment for respirators. However, medium-level cleaning is possible, and low-level should be undertaken regularly.

Naturally, all respirators should be issued on an individual basis, and every step should be taken to minimise the risk of mistakes and mix-ups.

According to the researchers, the methods recommended by respirator manufactures include:

- **Alcohol wipes**
- **Quaternary ammonium compounds**
- **0.3% glutaraldehyde**
- **Various other detergents/disinfection products**

James Johnson and Richard Stein are that the person responsible for the respirator program must determine the desired level of disinfection. The choice of method may not be easy, since the recommended methods vary significantly from manufacturer to manufacturer. The two experts conclude that more research is needed to quantify the level of disinfection required for various types of respiratory equipment.

James S. Johnson, Ph.D., C.I.H., Lawrence Livermore National Laboratory, Livermore, California & Richard L. Stein, Ph.D., Survivair, Inc., Santa Ana, California, Nov 1993, ***A primer on Decontamination of Respirators***, (conference material), 6th Conference, International Society for Respiratory Protection, Tokyo, Japan, 12 Nov 1993

A clean swipe

A clean work environment is often an essential part of occupational safety. But sometimes, the cleaning itself can cause occupational problems.

Cleaning is something we notice when it isn't done properly. Few people are overly concerned with *how* cleaning is done. The old mop and bucket are often the only idea people have of this important — if not essential — facet of industry.

But the mop-and-bucket method may be on the way out. According to Rolf Tenser, an expert consultant on floor cleaning, there is far too much water, too many heavy swabs, aggressive detergents, unsuitable floor coverings and uneducated cleaning personnel.

Plenty of savings

There is a lot to gain in an effective cleaning system. A lot of money can be saved by increasing cleaning workers' health and decreasing the use of chemicals. A recent study showed that cleaning costs could be cut up to 40 per cent by selecting appropriate floor surfaces and applying dry cleaning methods.

In many cases, the following points can mean a much more effective cleaning system and great savings on chemicals and sore backs:

- **Put in plastic floor coverings strengthened with polyurethane**

The polyurethane means that dirt and grime does not stick to the floor in the same way as on ordinary plastic or linoleum floors

- **Once a month, use a cleaning machine and dry polish afterwards**
- **Daily cleaning with disposable cloths treated with paraffin oil**

This type of cleaning means significantly less friction and heavy work that's bad for the back, compared to mops.

It is not enough to cover old floors with polyurethane. The floor must be right from the start,

Using water is only a way of spreading the dirt and making it look prettier, according to Mr Tenser. More preferable techniques are dry, or utilise smaller amounts of water. Some methods utilise specially treated mops of low-friction materials that operate on the principle static electricity, effectively acting as "dust-magnets".

In hard-to-clean areas, small cleaning machines could be used. It has been estimated that cleaning machines can be cost-effective in areas as small as 75 m², if required daily.

Physios agree

Physiotherapists concur that the mop-and-bucket method is very hard on the spine. The wet mop weighs several kilos, and the friction between the wet yarn and the floor makes it very taxing on the back to move it from side to side. The back stress is further added to by frequent lifts to re-wet the mop.

In other words, the less water, the better. In order to minimise friction and stubborn stains, the floor surface should be as hard as possible.

These considerations are of interest to architects and floor designers. Good, efficient floor cleaning starts *outside* the room. There should be good shoe-wiping facilities, and there should be a few metres of textile carpet to clean dirt and grit off the soles.

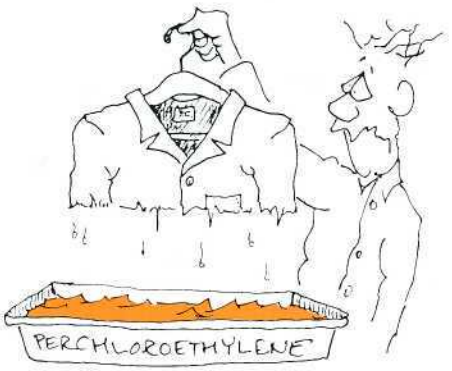
More research needed

Cleaning methods and floor design are attracting more and more interest and research. New inventions attempt to keep floor surfaces hard and cleaning- friendly without becoming slippery. The latest developments involve "clever floors" with a hard surface which yields slightly as you walk across it, creating tiny anti-slip grooves under your foot with each step,

Source: Berlin E. 1993, *Arbetsmiljö*, No 15, pp 31—33

"Clean" cleaning

It is now possible for drycleaners to replace hazardous perchloroethylene with less harmful cleaning agents



European drycleaning shops have started to move away from the traditional perchloroethylene, which is carcinogenic and can cause severe kidney damage, to more benign, water-based chemicals.

Users of the new systems claim that 90—95% of the cleaning can be done without the need for the hazardous chemical. Contact with solvents is eliminated, and there has been a marked difference in the health and well-being of staff. The air is cleaner, and no waste materials have to be sent away for treatment.

There is a risk that, since cleaning agents that contain CFCs are being phased out, many drycleaners may revert to the use of perchloroethylene.

In Sweden, all chlorinated solvents will be banned from 1996. However, perchloroethylene has been spared the ban, since there were no feasible alternatives.

The Greenpeace organisation demands that perchloroethylene be included in the list of prohibited materials. Greenpeace points out that there are three chlorine-free systems that could be used as substitutes.

Two of the possible substitutes are water-based: the German Miele-Kreussler system, which is built around biodegradable tensides, and the Swedish Electrolux Wascator system,

The third is the American Ecoclean system, which utilises natural soaps, steam and vacuum.

Source: Lundgren, H. 1993, *Arbetsmiljö* No. 14, p 7

CHEMICAL FACTS

Silver nitrate

Characteristics:	Colourless crystals
Aust. TWA:	0.01 mg/m^3 (as Ag)
Fire:	Non-combustible, but may cause fire in contact with other materials. May emit toxic fumes of NOx when heated.
Inhalation:	Fresh air and rest
Skin contact:	Flush immediately with copious amounts of water (even inside clothing). Remove soiled clothing after rinsing. Corrosive damage must be treated by physician,
Eye splashes:	Rinse immediately with water for at least 15 minutes, holding the eyelids well apart, Urgent transport to physician,
Ingestion:	If the person is fully conscious, give one or two glasses of milk or water, Urgent hospital transport.
Prevention:	If possible, use enclosed systems, or at least mechanical exhaust at the source, Keep all containers tightly closed. Avoid any contact with the substance. Emergency shower and eye rinse station should be available, Full face mask with particle filter or SCBA may be required. Eye protection, protective gloves and other protective clothing should be used if there is a risk of skin contact,

Source: *Skyddsblad* 1983, Swedish National Institute of Occupational Health, Stockholm, Sheet # 178

Education is good Understanding is better!

Noise drives me... lazy?

Noise doesn't have to be damaging to the ear in order to present a problem in the workplace. Noise can simply be a disturbing, distracting factor that affects both work performance and general well-being.

Much attention has been paid to industrial heavy noise that can cause permanent hearing damage, But industrial noise is not the only type of noise that can cause severe problems in the workplace. Continuing or intermittent noise of almost any kind can be one of the biggest occupational disturbances for workers, and can even contribute to physical health conditions, such as high blood pressure, muscle tension and stress hormones in the blood.

Disturbing noise, rather than damaging noise, is commonly encountered in industry, offices, hospitals and schools. Office machines, people talking, ventilation equipment and air conditioners, traffic noise — the list of sources of nuisance noise is long.

It is estimated that one in four employees is affected by nuisance noise. Not only adults are concerned: one of the biggest problem areas are classrooms in schools, where talking students, moving chairs and slamming desk tops can constitute a high level of nuisance noise. The situation is not made any better by the poor acoustic design of many classrooms,

Continuous and intermittent noise

Uneven, intermittent noise is more noticeable than continuous, monotonous noise. Employees frequently do not even notice the hum from the ventilation system until it is turned off. Therefore, it is more common to attribute any annoyance to the intermittent noise, and to devise methods to reduce the noise,

But low-frequency, constant noise can cause physical discomfort without the employee even knowing it is there.

An experiment conducted by professor Anders Kjellberg, Ph.D., of the Swedish National Institute of Occupational Health in Solna, Sweden, showed clearly the relation between noise — even if it is unnoticed — and performance, A group of women were instructed to solve relatively complex logical verbal problems. During the test, the women

were exposed to simulated ventilation noise, A control group performed the same tasks in complete silence.

It was clear that the silent control group quickly "cottoned on" to how the test was constructed, and how best to perform the tasks. The noise group never worked this out, and continued to work slowly and with a high level of mistakes, Yet, when the simulated noise was turned off, the mistake rate was very quickly reduced by half.

None of the women knew that background noise was the objective of the experiment, and only noticed the noise when it was turned off,

Social and psychological effects

Nuisance noise causes concentration difficulties, and can increase the rate of mistakes and, consequently, accidents.

Noise can also have social effects. It has been found, for instance, that people become less helpful in noisy situations, The level of stress hormones in the blood also rises, as does the level of muscle tension in the body,

There is probably a connection between nuisance noise and chronic high blood pressure, according to professor Kjellberg.

The extent of the annoyance depends on the individual. Attitude plays a role, as does the general environment in which the noise exposure occurs,

Paradoxically, those people most affected by low background noise are the hearing impaired. They react strongly even to relatively low noise levels, The nuisance noise can make it difficult to understand voice communication, and can distort the perception of useful or pleasant sounds.

Consequently, people with hearing impairment need a quieter working environment than people with normal hearing.

(Cont. page 8)

5. Food and drink

A heavy meal makes you sleepy. A light snack doesn't. Coffee is not such a great idea: the brain adjusts to the caffeine, and requires larger and larger amounts to stay awake.

6: Light

Poor light stimulates sleep. Good lighting, at least 1,000 lux, works to keep us awake.

7: Temperature

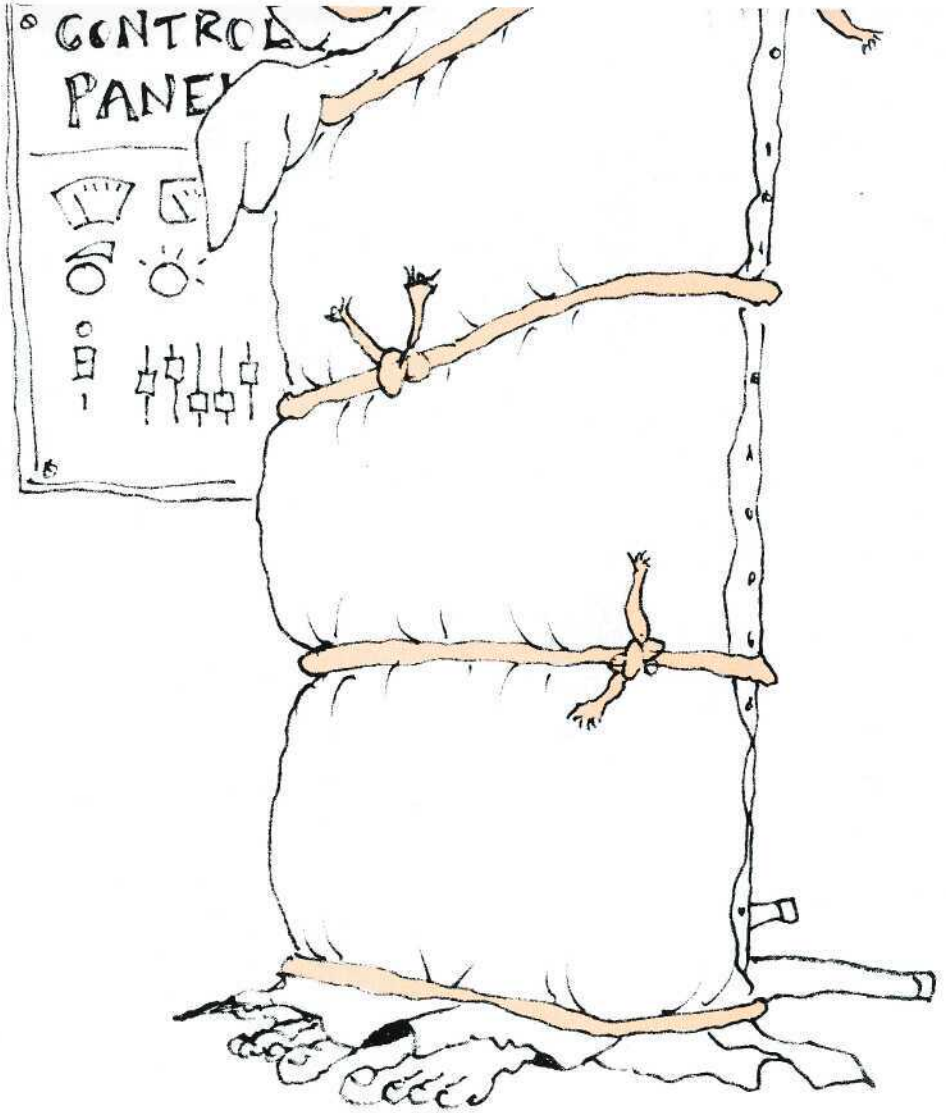
Cool, fresh air — especially in the face — keeps us awake. Heat has the opposite effect.

8: Sound

Constant, monotonous noise sends us to sleep. Intermittent, varies sounds act as an alarm clock. A radio can help to keep us awake.

9: Smell

Certain odours, such as peppermint, have been shown to have an uplifting effect.



Source: *Arbetsmiljö* 1994, No 1, p 6 (Quoting *New Scientist*)

WAKIE-WAKIE!

Every worker in every job can be affected by fatigue. Sleepiness can have catastrophic consequences; both the Three Mile Island and the Chernobyl disasters could have been avoided if the staff had been alert and **on-the-ball.**

Through evolution, the human brain has been conditioned to the day-night cycle, and night shifts are not "compatible" with the brain's normal rhythm. During the dark hours, performance is at a low, and the accident rate increases. There are nine key factors that can make a difference to those long, dark night hours:

1: Danger

There is nothing as effective for keeping us on our toes as danger. Not a practical method to use at work, but the stimulation can be achieved by making work more interesting or utilising exciting ideas in the work procedure.

2: Exercise

Going for a walk, stretching and chewing bubble-gum all contribute to keeping us awake and alert. A bit of a jog around the block has an invigorating effect for about an hour after you finish.

3: The biological clock

The body-clock is difficult to change. Rotating the shift hours in an anti-clockwise fashion may be beneficial, as may days off work between shifts. A 12-hour shift over three or fours days a week can also help.

4: Sleep

Anyone who hasn't had a good sleep will be tired, no matter what measures are taken. The need for sleep accumulates, and in the end, nothing can be done to overcome the problem — except adequate sleep.

(from page 5)

Chatter most disturbing

The most disturbing type of noise that is actually human conversation, probably because it is the most difficult to ignore or "tune out".

Whether a noise is disturbing or not is often a subjective matter, Noise produced by the individual, for instance the noise of the typist's own typewriter, is not perceived as annoying, whereas noises out of the person's control, such as traffic noise, is experienced as nuisance noise.

It is not yet clear what type of noise will affect performance, The actual noise level seems to have little to do with it: a low, quiet, constant noise can have detrimental effects, while another noise at 85 decibel may not affect performance at all.

Few guidelines exist, but if human conversation is a requirement, background noise should be kept below 45 dB(A). Ventilation systems should not create noise levels above 35 dB(A), and if the employees are required to concentrate, the ventilation noise should not exceed 30 dB(A).

Reduction methods

The ideal method is to reduce the noise at its source, either by replacing noisy machines with quiet ones, or by isolating the machines by moving them to a separate location.

If this is not possible, attempts should be made to shield the machines with noise insulating hoods, booths or barriers.

Ventilation systems are more difficult, but the problem could also be as simple as adjusting the fan setting, Mufflers are also a possibility.

If only a certain group of employees are complaining of nuisance noise, the answer could lie in the design of the room, or that those people may perform work that requires more concentration.

Some noise reduction measures may present an extra cost to the company, but this is more than compensated for by a better work environment, higher morale, increased well-being and, consequently, minimised mistake rates and improved work performance,

Source: Kjellberg A. 1990, 'Subjective behavioural and psychophysiological effects of noise', *Scandinavian Journal of Work, Environment and Health,* No 16, suppl. 1, pp. 29—38 (Quoted in *Forskning & Praktik,* No 4/1993, pp. 18—20)

Scents of danger

"Replace filter immediately if you can smell the chemical through the mask", is sometimes the message on the respirator cartridge label. But can you trust your smell sense to detect the smell of the chemical?

There are two systems in the nose that detect smells. The first is the olfactory system, or the sense of smell. This system analyses the odours brought in through the breathing air. Good and bad smells are analysed equally; the scent of a rose and the pong of an old sock,

The second system comprises the trigeminus nerve, a sensory nerve that registers heat, touch and pain. The trigeminus is more of an "alarm system", set to ring the warning bells when encountering penetrating chemicals, When the trigeminus acts, the brain is set to prepare for escape.

However, research shows that the trigeminus nerve probably reacts to a lesser extent to nearly all odours. In fact, only two substances have been found that cause no reaction in the trigeminus: vanilla and decanoic acid, a hydrocarbon.

Disappearing smells

Really bad odours are disappearing from the industry, owing to the implementation of enclosed systems, remote control, automatic handling, pipeline systems and so on. Still, in many places, such as in farming and in pulp mills, bad smell is an unavoidable evil.

Definition of smells

Odour is still a mysterious field of science. Nobody knows exactly what a smell is, or what the sensory cells do to distinguish one smell from another, Smell doesn't have particular wavelengths systems, like sound and light. No-one really knows what differentiates, say, the smell of a lemon from that of an orange.

Even the way we describe smells (for instance on Material Safety Data Sheets) is extremely vague. What is ***pungent***? What is ***aromatic?*** By far, the best way we can describe an odour in conversation is by likening it to another substance: "Smells like a lemon, like candy, like rotting meat". Below is a list of the characteristic odours of various chemicals. If you think about the chemicals in the list you have smelt, you will immediately realise how precise our sense of smell is, and how inexact our ways of describing their smells are:

Chemical	Smell
Acetaldehyde	green, sweet
Acetic acid	sour
Acetone	sweet, pungent
Benzene	sweet, aromatic
Carbon disulphide	pungent, manure
Carbon tetrachloride	sweet, pungent
Ethanol	sweet
Hydrogen sulphide	rotten eggs, sulphur
Methyl mercaptan	pungent, worse than pig manure
Nitrobenzene	pungent, shoe polish
Phosgene	like hay
Pyridine	burnt, pungent
Styrene	plastic
Toluene	glue

Varying sensibility

Do two buckets of pig manure smell twice as bad as one bucket? Does 20 ppm of hydrogen sulphide smell half as bad as 40 ppm? If you mix hydrogen sulphide with methyl mercaptan, will it smell worse or the same?

Quantifying smell is another difficult area. Some interesting experiments have been undertaken in this field.

In the case of concentration, a doubling of the dose of hydrogen sulphide only scored 1.4 in increased unpleasantness,

In the case of mixtures of foul-smelling chemicals, blends of two or three substances produced slightly higher degrees of discomfort, while adding a fourth and a fifth chemical caused the unpleasantness to actually diminish markedly.

The blending of complex smells is of great interest when it comes to very **good** smells, namely to the perfume industry. It is generally accepted that the most expensive and highly regarded perfumes are very complex blends of many different substances: the complexity results in subtlety. Less expensive perfumes are usually less complex, with their characteristics resting with one or two major, easily distinguishable components: the simple perfume smells "cheap".

Respirator users

The smell sense is extremely adaptable, and quickly gets used to prevailing odours. The nose becomes "dulled", and won't react again until another chemical is added to the atmosphere. This is the problem of telling respirator users to change filters when they can smell the chemical,

Although most hazardous chemicals have odour levels well below that exposure limit, the human sense of smell is very unreliable.

Not only can it become accustomed to a particular smell, but many external factors may affect the acuity of the smell sense, such as a head cold or smoking habits. (By the way, it is a misconception that smokers lose their sense of smell. The diminution of the smell sense is very small, even in heavy smokers. The notion of all the fresh smells "coming back" in those to quit is probably only wishful or positive thinking. Throughout life, whether you are a smoker or not, the odour cells are replaced every 30 days.)

Furthermore, some hazardous chemicals have no smell at all, while other have such a strong odour that they can paralyse the olfactory system.

Another danger associated with smell-guided filter changes is that the chemical in question may have deteriorating effects on the central nervous system: if the employee can smell the chemical, he or she may already be groggy and fatigued, and may act with poor judgment or even disregard to the danger.

The rule for respirator users remains:

The only way to change filters is according to an accurate replacement schedule

Source: ***Forskning & Praktik*** 1993, No 4, pp. 34—37

Micro organisms

Microorganisms are found virtually everywhere. They grow on the skin, on mucous membranes, in huge numbers in our intestines, where they are a prerequisite for normal digestion. But amongst the "goodies" there are also "baddies" that can cause respiratory and other conditions in a wide variety of occupations.

Some microorganisms like high temperatures, and flourish in 90°C heat and pH- levels under 2, in hot volcanic sulphur springs. Others thrive and profligate in near-freezing temperatures in Polar regions,

The human body has developed defence systems to protect it from hostile microorganisms, However, the microorganisms can sometimes overcome the defence mechanisms, and cause infections. Damage to the body can also occur without any infection, as a result of activating the host body's defence systems.

High-exposure occupations

It is tempting to think of microorganisms only in relation to rural work, animal keeping, hay and grain storage and so on. But microorganisms occur in a wide array of environments, such as those listed below:

- **Farming**
- **Animal husbandry**
- **Grain handling**
- **Wood products (wood chips, cork)**
- **Mushroom growing**
- **Composting stations**
- **Cotton, hemp, flax handling**
- **Water purification works**
- **Cutting oils**
- **Air humidifiers**
- **Printeries**
- **Museums**

Toxic effects

There are several ways in which microorganisms can have detrimental effects on the body, Many have the ability to discharge toxic substances.

Some of these excreted substances can be useful to humans, and are used in antibiotics and cyclosporines.

Defence mechanisms

The human body has several different weapons in its arsenal of microbial warfare. A few of these include:

- ***Macrophages*** **are special cells that can "swallow" and digest microorganisms.**
- **Further, there is a group of about 20 *proteins* which can recognise the microorganism. They gather on the surface of foreign cells and excrete a special substance which attracts phagocytes.**
- **The *Immune system* produces antibodies that attack the microorganism. Again, foreign cells which are covered with antibodies are recognised by the macrophages.**

Diseases

The most common health problems caused by microorganisms include:

- **Allergic alveolitis**

Caused by inhalation of fungus spores. Usually, the source is mould dust, for example in farming and in sawmills where the wood is not properly dried. Allergic alveolitis is a serious lung disease, often with a permanent reduction of the lung function.

- **Febrile reactions (organic dust toxic syndrome or ODTS)**

These reactions are characterised by fever and shivering, sometimes accompanied by joint pains and general symptoms similar to influenza. Febrile reactions are much more common than allergic alveolitis (about 30—50 times more common), and is usually by inhalation of high concentrations of fungal spores. This problem is not confined to farming, but also occurs in cotton factories and in places where inadequately maintained air humidifiers are used. Sensitisation does not seem to occur.

- **Chronic respiratory inflammation (heavy chest, cough, "Monday chest")**

Causes chronic cough with phlegm. Probably caused by a combination of factors, of which microorganisms is one. Allergic asthma and hyper-reactive bronchi may occur, but this is probably caused not by microorganisms, but by mites.

- **Mucous membrane irritation**

Occurs in many different environments, including "sick buildings". The major symptom is irritation to the eyes and upper respiratory tract. The exact cause is yet unknown.

- **Allergic asthma and allergic rhinitis**

Caused or aggravated by fungal spores in the air. Rhinitis is the most common form of allergy to fungus.

Incomplete research

Information is scant on respiratory non-infectious inflammation caused by microorganisms. There are two main groups of inflammation of this type: acute reactions and long-term immune-related disease (allergic alveolitis). In some ways, these diseases can be looked upon as normal defence reactions to extreme exposure to harmful microorganisms.

It is important to separate these diseases from allergic asthma and allergic rhinitis, where the patient is often extremely sensitive to very common and entirely harmless substances,

In many cases, the total dust concentration in a workplace may be of less significance than the spore count.

It is not known whether the microorganisms have to be alive or not in order to cause damage, nor do scientists know whether some fungi are more disease- promoting than others.

It is, however, important to minimise workers' exposure to mould, fungus and other organic dust. This advice is not confined to the rural industry, but to many industry locations, including offices.

Source: Malmberg P. 1991, 'Muicroorganisms', ***Arbete och Hälsa***, 1991:44, Swedish National Ulnstitute of Occupational Health, Solna, Sweden

Styrene remains in the genes

A Czech study of laminating workers suggests that styrene remains in the genes and is suspected of promoting lymphatic cancer and leukaemia.

Similar studies are being undertaken in Sweden. Large numbers of people work in the plastics industry, many of whom are exposed to styrene in their work.

Source: ***Arbetsmiljö*** 1993, No 12, p 15

A cleaner in Northern Vancouver
Was really a shaker and mover
She went head over heels
Started cleaning on wheels
At hair-raising speeds with her Hoover

Summary

- **Should respirators be disinfected? (page 1)**
  Routine decontamination of respirators may be necessary to eliminate the risk of pathogens spreading in the workforce. There are many methods, ranging from simple manual cleaning to treatment with powerful antiseptic chemicals,
- **A clean swipe (page 3)**
  Savings of up to 40% can be made if floor surfaces and cleaning methods are fine-tuned. As an added advantage, cleaning workers' health can be preserved, and harmful chemicals can be avoided.
- **"Clean" cleaning (page 4)**
  Dry cleaning businesses now have the option of replacing hazardous chemicals with harmless ones — without losing the cleaning power.
- **Chemical fact (page 4)**
  Silver nitrate
- **Noise drives me...lazy? (page 5)**
  Noise doesn't have to exceed safe levels to cause great problems. Low-level noise can cause irritation, poor health, high blood pressure and significantly reduced work performance — even in a relatively quiet office.
- **Wall chart (page 6—7)**
  Wakie-wakie! Hints on how to keep awake during those graveyard shifts.
- **Scents of danger (page 8)**
  How does our sense of smell work? Certainly not well enough to be trusted to alert us when respirator filters need to be changed.
- **Micro-organisms (page 10)**
  Micro-organisms are not confined to rural activities. In fact, they live just about everywhere — and can cause great problems for unsuspecting workers in almost every field.
- **Styrene remains in the genes (page 11)**
  According to new research, styrene is capable of remaining in the genes, causing leukaemia and other diseases.

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