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A Day in A Life Of A Building Biologist

Kelly Abeleven is a Building Biologist on a mission to “cure” the building and construction industry from Sick Building Syndrome, which has existed for decades — Omesh Jethwani, Government Projects & Programs Manager, held an exclusive interview.

To a classroom of six year olds in a show and tell, how would you define building biology and the role of a building biologist?

A building biologist looks for and fixes health hazards in the home. What makes you sick, sneeze, cough, or get a runny nose when you are in your home? Why is it that you can't sleep at night and wake up feeling tired and grumpy? What is that weird musty smell in the bathroom downstairs? Why do you need to remove the leaves in the gutters, clean up your room, put your pillows out in the sun and pull back your bed sheets on a regular basis? A Building Biologist also helps builder designers build healthier homes so people don't get sick.

Who is the person responsible for this awareness movement?

Nicole Bijlsma is a Building Biologist, bestselling

author (Healthy Home Healthy Family), former naturopath and acupuncturist, PhD candidate and founder and principal of the Australian College of Environmental Studies which she established in 1999 to educate people about the health hazards in the built environment. Nicole established the Building Biology industry when she began to notice the extent to which the environment was causing illness in many of her patients and, after personally experiencing insomnia and ten miscarriages which she believes arose from sleeping near the meter panel shortly after moving into her home in Warrandyte. Nicole completed eight years of training at university as well as pursuing further studies in Traditional Chinese Medicine in China in the early 1990's. After several years in clinical practice however, it became obvious to her that her training did not provide the knowledge or the skills needed to treat patients with asthma,

allergies, or those suffering from chronic conditions affecting multiple organ systems. She consequently began to conduct house audits and found the 'elephant' was present in most people's homes.

What are some of the most typical and non-typical hazards on a Building Biologist checklist?

There is a large body of scientific knowledge correlating allergens like house dust mites, pollens, pet dander and mould with asthma and allergies; toxicants in air and water like pesticides to solvents, flame retardants, fragrances and glues to learning and behavioural problems in children, neurodegenerative disorders and a growing number of environmental sensitivities; in addition to electromagnetic fields used in wireless technologies to insomnia and other adverse health effects. In light of the amount



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of time spent indoors, and the push to create tight, energy efficient homes with compromised ventilation, the number of new builds in temperate climates experiencing condensation and mould-related problems appears to be rising. In addition, homes built in warm, humid climates where the relative humidity exceeds 70% are also at risk for condensation and mould-related issues.

Australia has one of the highest rates of allergies in the world, affecting one in four people and most of the allergens can be found in the home.

The **age of the building** is one of the most important questions to ask, because it frequently identifies hazards that may be present:

- Asbestos used in most Australian homes from 1945 – 1985
- Lead commonly used in various products from paint (up to 1965), lead solder on galvanised metal and copper water pipes, and lead flashing on the roof (a concern if you drink tank water)
- Organochlorine pesticides were extensively used on farms and routinely sprayed under the slab of most homes in the 1980s and have been correlated with numerous adverse health effects
- New homes take years to outgas the chemicals emitted from paints, sealants, adhesives, carpets and cabinetry. In addition, new homes in temperate climates appear to experience more condensation and mould-related problems because of the inability of water vapour to move through the building envelope
- Wireless technologies emit radiofrequencies which can reflect off metal materials like sarking, vapour barriers and metal rooves creating a microwave-oven effect. Whilst this can be an advantage to reflect external sources arising from mobile phone towers or the neighbour's smart meter, it can increase exposure from internal sources like routers, cordless phones and wireless printers for example. Sleeping in these fields has been shown to affect melatonin, which is important for sleep, circadian rhythm and immune and hormonal function.

Nicole's research has uncovered that the home's proximity to known hazards is an important marker that the building biologist needs to establish. For example, is the home within 40 kms of an open cut mine or coal fire power station; 2 kms from a farm or golf course that employs crop dusting; 1 km from a wind turbine; 500m downwind from traffic-related air pollutants or a coal corridor; 400 m of a mobile phone tower or high voltage transmission line; or have they built their home above a known radioactive deposit that may increase the occupants' risk for lung cancer?

Are there any rare symptoms that only a Building Biologist is able to diagnose?

Building Biologists are not trained to diagnose

illnesses, rather we work in conjunction with health and general practitioners to identify potential triggers in their patient's home and provide simple and cost-effective solutions on how to reduce or avoid exposure. This may involve (amongst many things) educating the client as to how to reduce their exposure to toxicants in cleaning products, implement integrative pest management, how to reduce exposure to the chemicals emitted from new furnishings, how to use technology and position wireless sources in a way that reduces exposure to radiofrequencies, provide tips to reduce exposure to allergens, and advice on how to prevent the build-up of water vapour in the home that leads to condensation and mould-related problems.

We also network with a broad range of professionals from tradespersons (electricians, plumbers, hydrologists), to mould remediators and health and medical fields. Diseases that we frequently find that maybe correlated to hazards in the home include asthma, allergies, eczema, recurrent colds and flus, sleep disturbances, headaches, learning and behavioural disorders in children and chronic fatiguing illnesses for which there is no other explanation.

How does one become a building biologist? Is there an exciting career pathway for an individual who chooses to embrace the role of a building biologist?

Building Biology is ideal for anyone who cares about their health and the health of future generations and is ready for an eye opening and life-changing experience. This career is ideal for people who are solutions based, want to educate and empower people to make healthier choices in the home, whilst providing a consulting service that is flexible and financially rewarding. The growing awareness of the adverse health effects arising from exposure to electromagnetic fields, toxicants, noxious gases, allergens and mould, has significantly increased the demand for Building Biology graduates, with most referrals coming from doctors, health practitioners and building designers.

The nationally accredited Advanced Diploma of Building Biology (10194NAT) is a 2 year full time / 4 year part time course available through the Australian College of Environmental Studies (RTO 21740). The course also contains standalone modules like Mould Testing, Electromagnetic Field Testing, Healthy Home, Design a Healthy Home and Children's Environmental Health which is ideal for tradespersons, architects, building inspectors, building designers and health practitioners to increase their skill base and differentiate themselves from their competitors.

Which gender currently dominates the role of building biologists and why?

The industry currently attracts 70 per cent women and 30 per cent men. There are more women because women are more likely to look after their sick children and make the

connection between the sickness and the home. Women also have a higher body burden of toxicants because they are the primary consumers of personal care and cleaning products, and they have a higher body fat to muscle ratio and consequently are more likely to be diagnosed with chronic fatiguing illnesses. I think it is also about our fierce protective nature, when one has experienced a miscarriage, especially reoccurring, you will do anything to find answers. We are certainly living in good times with the amount of scientific literature out there, but to help with stress levels, always take information from trusted sources only.

What can one expect to find in a Building Biologist toolbox?

We use lots of tools! Thermal camera, moisture meter, indoor air quality meter, bio pump and cassettes (air sampler for microbes), bio tapes, microbial swabs, ATP meter, portable vacuum cleaner and cassette (dust and allergen sampling), gauss meter (AC magnetic fields), high frequency meter (radiofrequencies used in wireless technologies), UV lamp, full face respirator, protective clothing (Tyvek suit, gloves and booties) and of course a toolbox full of stuff (screw drivers, hammer, Brad nails, electronic tape measure, LED torch...).

What is the difference between green building and building biology?

Where the primary goal of 'Green' building schemes is to design and construct buildings that are structurally sound, fire resistant, energy efficient and that do not adversely impact the environment, the primary focus of a building biologist is to evaluate and control hazards in the built environment that may adversely impact human health. Whilst the building biology industry supports the use of materials that are sustainable, recyclable and that do not adversely impact wildlife or ecosystems, the push to create tight buildings with impermeable vapour barriers and compromised passive ventilation appears to have resulted in more condensation and mould-related problems, and increased exposure to toxicants outgassing from imported building materials and furnishings. In addition, people with environmental sensitivities react to the electromagnetic fields emitted from compact fluorescent lighting, which are also an environmental and human hazard when the mercury vapour is released when they are accidentally broken or discarded.

Why has there not been more focus on the biological sustainability of the built environment, given that people are spending 90 percent of their time indoors?

Doctors, naturopaths and allied health practitioners are not trained in environmental medicine, so the connection between disease and hazards in the built environment has largely been missed. Completion of the human genome project in 2003 however, confirmed that "Genetics loads the gun, and the environment pulls the trigger" and a growing



body of evidence in the scientific literature is correlating various disease states like asthma, allergies, cancers (lung, breast, brain, prostate and testicular) and chronic fatiguing illnesses with various toxicants, allergens and electromagnetic fields that are frequently found in the built environment. In light of the fact that it can take 17 years for scientific discovery to get to the clinician's practice, this transition has been slow, which is why the Building Biology industry was established to create a bridge between integrative and health practitioners and building trades.

In February 2017, Harvard T.H. Chan School of Public Health released the 9 Foundations of a Healthy Building. What are the 9 Foundations and in your opinion, why were the 9 Foundations listed as the core elements of healthy indoor environments?

The nine Foundations are Ventilation, Air Quality, Thermal Health, Moisture, Dust and Pests, Safety and Security, Water Quality, Noise and Lighting and Views.

The nine Foundations listed are definitely important, but just a start in my opinion and the list is missing some important factors such as electromagnetic fields and site selection. Anything which looks to improve the health of the indoor built environment is a positive in my eyes. Buildings need to have a positive impact

on people and the environment, they should also support our health, and the health of the environment.

Buildings should be built in harmony with nature with factors such as air quality, water quality, ventilation, moisture and thermal health, as included in the 9 Foundations of Health, taken into account in the planning stage.

This could help with health effects such as asthma, fatigue, headache and irritation from common indoor pollutants including flame retardants, carbon monoxide, lead, benzene and pesticides which enter our body through breathing, swallowing or through our skin.

Does the responsibility lie on the architect or the builder to achieve the 9 Foundations of a healthy building?

We believe all those involved in the design and construction of a building should be well versed with the knowledge and the skills to create healthy buildings. The architect should design the home according to the microclimate and topography of the site; select materials that don't adversely affect indoor air quality, have good hygroscopicity and that do not increase the occupant's exposure to harmful electromagnetic fields, radioactivity or toxicants; allow for the movement of water vapour through the building envelope; select appropriate cooling and heating systems that take into consideration the occupant's existing health

status; and to support the health and wellbeing of the occupants living and/or working in the building. Ideally the location of the site should be assessed for known hazards to see if it is even suitable for the occupants with pre-existing conditions like asthma, allergies and chronic fatiguing illnesses.

Builders should be familiar with the appropriate installation and cure rates for concrete and masonry, prevent materials becoming sodden during the construction phase, construct the home to reduce the build up of water vapour (exhaust fans to vent steam to the outside and not the roof cavity), use of intelligent and permeable vapour wraps, ensure sufficient gaps in the roof cavity (from cladding) and subfloor (where appropriate), prevent thermal bridges, ensure adequate water proofing of wet areas, wire the home in a way that doesn't expose the occupants to high AC magnetic fields or radiofrequencies amongst many other recommendations. Builders also have a duty of care to be familiar with mould testing and remediation to ensure they don't create secondary damage and contaminate the rest of the home when they conduct renovations that involve removing water damaged materials.

In your opinion, which countries have set examples as caring leaders which have significantly contributed to the health and wellbeing of their people?

Different countries are leading the way with different hazards and the setting of standards. Researching the countries that are setting examples in caring about the health and wellbeing of their people is a time consuming and in depth task, this is why it took seven years to develop the Building Biology course. I think education is desperately needed, especially in relation to the safe removal of lead based paint, working on a water damaged building etc. This is important due to the health and transgenerational effects of some toxicants, as well as their persistent nature. Until standards are improved we recommend using the precautionary approach.

Some examples include:

- In Europe, chemicals are regulated through REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) which places the responsibility on industry to manage the risks and provide safety information. In Australia and the USA, the burden of proof is on the government to prove a chemical can cause harm.
- Triclosan – a broad-spectrum antibacterial agent used in a wide range of consumer products was banned from consumer products in the USA, as a result of concerns that it is a hormone disrupting chemical. The European Union labels triclosan "irritating to the eyes and skin, and dangerous for the environment". Yet in Australia the National Industrial Chemicals Notification and Assessment Scheme concluded in their review that there was "no concern for the public", so it continues to be used in cosmetics and personal care products including toothpaste.
- Radiofrequency electromagnetic energy – banned in childcare centres and kindergartens in France. Removed from childcare centres and kindergartens in Cyprus. Russian National Committee on Non-Ionising Radiation Protection (RNCNIRP) have documented their concerns about wireless technologies for many decades.
- CCA (copper chrome arsenic) – The use of CCA is restricted in Japan, Sweden, the European Union, Canada and the USA and is banned in Switzerland. CCA was restricted in Australia in 2006.
- Condensation and Mould – USA, Britain and Canada have standards pertaining to the mitigation of condensation and mould in new homes. There is no regulatory requirement

within the Australian National Construction Code to mitigate mould and condensation within new buildings.

Do you think Australia is on a par with the rest of the world when it comes to finding a cure for Sick Building Syndrome?

Most countries do not seem to be aware of the magnitude of 'sick building syndrome'. Exposure standards for chemicals and electromagnetic fields are not adequate to protect us. Most often, people don't realise that the industry doing the harm is also the one setting standards.

Most exposure standards for chemicals in everyday products and electromagnetic fields are not health-based standards, but rather

pesticides found in a home is tracked in from your shoes. Have a thick piled door mat at the entrance which is regularly beaten and a place that occupants and guests can place their shoes before entering the home. If you stop wearing your shoes inside your home, you can reduce the amount of dust by 50%.

2. Get a water filter to remove contaminants. Chlorine and fluoride in drinking water are associated with health risks.
3. Reduce the chemical load in the home. Air fresheners, perfume, pesticides, solvents, paints, cleaning and personal care products contribute to poor indoor air quality.
4. Healthy cleaning
 - a. Use a vacuum cleaner fitted with a HEPA



are developed in consultation with industry to determine what is 'practicable' in a workplace environment. Exposure standards fail to account for multiple routes of exposure, mixture effects, transgenerational effects, the timing of exposure or individual human risk factors such as age, genetics, nutrition etc.

It would be great to see a future of building standards that assist in the safeguard of the health of our present and future generations by minimising health hazards and allowing people to live to their full potential.

What are Kelly Abeleven's Top Ten Steps To a Healthy Home?

1. Take shoes off before entering the home. Much of the dust and chemicals like

filter. Most conventional vacuum cleaners will exacerbate indoor dust levels by recirculating back into the air up to 80 per cent of the particles they draw in. A vacuum cleaner with a built-in HEPA filter will prevent dust particles from becoming airborne. A motorised head and electrostatic disposable bag is also recommended. Wipe settled dust with a damp microfibre cloth followed by a clean, dry tea towel. This will trap most allergens and keep them from becoming airborne. Use the sun to air pillows and mattresses, pet bedding, chopping boards and soft toys.

- b. Ventilate – enabling fresh air and negative ions to come into the room, reducing the

chemical load in the home and improving indoor air quality. Many chemicals found in the home that can trigger asthma and allergies can be reduced by opening windows on a regular basis (providing it does not bring in traffic fumes).



5. Create a sleeping sanctuary to give your body a chance to rest and recuperate. Buy Australian made as imported mattresses may contain formaldehyde and flame retardants. Mattresses and their casings should be made from natural fibres such as cotton, hemp, wool or latex. Ensure electrical appliances are at least 1 metre away from your bed, couch or any areas you spend time to reduce your exposure to electromagnetic fields. The AC magnetic field and/or radiofrequency radiation they emit, has been shown to suppress melatonin in the brain which impacts sleep/wake cycles and reduces your ability to rest.
6. Turn Wi-Fi off when not in use, use corded connections and a corded home phone (avoid cordless phones). Turn mobile phone off at night and use handsfree when talking.
7. Avoid clutter as it harbours dust, and house dust mites and attracts pests. Reduce the dust load as dust encompasses a wide range of potentially allergenic agents.
8. Mould is caused by dampness and moisture from roof leaks, condensation etc. Find the moisture first and remove the source. Remove mould with a damp microfibre cloth.
9. Avoid plastics, highly coloured ceramics, leaded crystal etc, by storing food and beverages in glass, stainless steel and lead-free ceramics.
10. Plants – Plants reduce airborne moulds and bacteria and plant-filled rooms generally contain 50-60% less airborne moulds and bacteria than rooms without plants, as long as they are not overwatered. Plants also connect you to the beauty of nature.

How does one find a building biologist? Is there a specialised organisation or association?

Visit the Australasian Society of Building Biologists website www.asbb.org.au and click on Find a Building Biologist.

***You were one of the nineteen women who had registered for the Empowering Women to Thrive in the Construction Industry 7-Stage Program. Your views on the Program overall and has it benefited you as a female working in a male dominated industry?**

Yes the program has been amazing for me. It has provided encouragement and support, it has shown that not only is change necessary, change is actually being implemented. To have the opportunity to take the time to research the health effects of a sick building, see what is actually affecting the health of our buildings and learning about how to create a healthy building as a building biologist, has been an enlightening journey and it is satisfying to share this with Master Builders NSW and the other ladies who participated in the program.

I think it's nice to have female input in the industry, especially when tradespeople don't have time to look further into certain products and their health effects etc. I would love to see buildings built with human comfort and health in mind, and the health of the planet, rather than merely building to make money. I believe the financial benefits of doing this over our lifetime and beyond will speak for themselves.

I thank Master Builders NSW and NSW Government (Women NSW) for this amazing opportunity. I think the fact that it is recognised that there is such an imbalance in the building and construction industry is a great start and the beginning of great change. and Yes – just to get together and talk about it and be given the encouragement to move forward is an amazing opportunity.

Do you think the Program should be introduced across board for all girls and women working in the Building and Construction Industry?

Yes, I believe this program, or a program defined specifically for the building and construction industry, would be extremely beneficial. We are at such an important time in this industry and we don't want to lose passionate and experienced professionals. This program, or a similar program, would be beneficial to all woman working, or who want to work, in the building and construction industry. When it has been recognised that change is necessary, and change has been

implemented, this surely creates a bright future!

If Master Builders NSW makes a funding application to assist more girls and women working in the Building and Construction Industry, what would some of your recommendations be?

- Educate women how the home can affect their families' health (asthma, allergies, sleep related disorders, various cancers...). Motivate women to have an interest in the industry, especially from a health perspective to ensure the industry can keep up with demand, and create a healthy future.
- Highlight the possible work/life balance, job satisfaction and different avenues women can explore in the industry. For example, building biology provides a financially rewarding income stream that enables you to make a positive difference to the lives of many whilst providing flexible hours (work around family or other commitments). It also creates the opportunity to work with a large network of professionals from doctors and health practitioners to building trades to create buildings that support the health of the building occupants.
- Have the women talk to other females in the industry. Passion goes a long way, women need to see this passion and understand that the building and construction industry is an amazing industry to be involved in. Talk to building companies, large and small, understanding the extreme importance of both and encourage everyone to work together to achieve the creation of buildings that we enjoy spending time in.
- Train women in industries such as building

biology. Builders and building biologists are a perfect match in my opinion, along with the other trades and services involved. For instance train a woman in a husband and wife building company, and the woman can be more involved in aspects of the build relating to health such as building material selection and where it is coming from (life cycle and embodied energy), PPE, remediation works and site design. A woman also has her partner's health in mind and cares about the toxins they are constantly being exposed to, as well as bringing toxins home on their clothes etc. If we all work together to achieve an important goal, building health, this would have such a positive impact on our health, the health of the planet and the health of future generations. From what I can see, the building biology industry is in demand and the only way to work, is to work together.....and we definitely need more building biologists.

- Requesting funding to assist with more women working in the industry really makes sense when you look at the amount of money that could be saved on costs of future healthcare if we really concentrate on important factors such as building health. The health of the planet, the air we breathe,

the water we drink, has an obvious and direct relationship to our own health and well-being. A healthy building is the creation of a healthy indoor environment by allowing a building to 'breathe', and by using materials and processes to regulate temperature, humidity, airflow and quality. I believe women have the skills and passion to help create natural homes, schools and workplaces that support our mind, body and soul. One of my favourite sayings is 'pay now or pay later' which is extremely relevant to this question. Pay for funding now to help the industry move forward in a healthier manner, or pay later with bad health, landfill issues, declining natural resources and expensive healthcare costs. I know what will be cheaper in the long run!

Kelly Abeleven, a Building Biologist, director of a Sydney building company and certified Water Damage Restoration professional, focuses with clients on optimal wellness principles in the home, schools and workplace. Kelly is an advocate for children's environmental health; in the home, schools, public buildings and the health of the planet. Kelly educates people to live in harmony with nature and to provide healthy, liveable, and low impact buildings with

reduced EMF exposure, reduced allergens, less chemicals, and improved air and water quality. Kelly inspires her clients towards making lifestyle changes in their homes that significantly improve their health and the health of their family. She encourages the creation of natural and healthy environments that form the framework for our physical, mental and spiritual health. Kelly serves as a committee member of the Australasian Society of Building Biologists (ASBB). For more information, visit buildingbiologynsw.com.au

**The Economic Empowerment & Leadership of NSW Women In Male-Dominated Trades project is supported by the NSW Government through Women NSW. The program, Empowering Women to Thrive in the Construction Industry, delivers tailored leadership and empowerment workshops that will enable new entrants' tradeswomen and current tradeswomen to obtain the essential skills and key competencies that will empower them to establish and/or grow their trade business. The project provides access to mentoring, networking and potential career opportunities for women interested in jump starting their career and being part of the Building and Construction Industry.*

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