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Neil Cherry, scientist, teacher, politician, peace worker

Part 11

Reducing exposure to electromagnetic radiation in homes and improving air quality in Christchurch

Dorothy - 28/07/03

Neil's interest in improving the health of Christchurch people has been wide -ranging - including reducing smog, at first believed to be caused by motor vehicle emissions and later by domestic fires, and reducing people's exposure to electromagnetic radiation from wiring and appliances at home and from cellsites erected in places where people, especially children, are vulnerable.

Importance of reducing EMR in homes

"One of the most important understandings is that we all live in low or moderate levels of these fields because of our household wiring and appliances. This explains a progressive increase in a wide range of health effects over the last century as the whole population has become exposed to low to moderate levels of these fields. This makes it more and more difficult to find worse effects in occupationally exposed groups as the background level is now so elevated," Neil explained.

Looking back over what he has learnt in the last thirty five years Neil notes that there are great benefits from a lot of the technology - warm homes, washing machines, cooking appliances - and the strong point he has been considering is whether technology could be made in a way that provides the service with much lower fields of EMR. The answer to the question is YES - that most technologies could be improved by a factor of ten to twenty. It supports the need for energy efficiency in homes - passive solar-designed homes which can reduce heating requirements by 80% to 90%.

He has measured the electromagnetic fields in modern and old homes in Christchurch and there is a difference of a factor of twenty or more, so we should improve the older homes in terms of moisture, draughts and energy loss. In the 1970s the aim was to move to all-electric homes, but this was done without the energy efficiency being considered. There are higher fields in those homes. Using an open fire would reduce the electromagnetic field but it pollutes the atmosphere and wastes energy. With appropriate energy planning it is possible to have a home which is warm, and has less fire risk and lower fields and to have lower power bills. Neil and Gae use the natural environment as much as possible. They open up the doors

and windows and have a fan at the top of the stairs as hot air rises and the fan blows it down again.

Passive solar heating for homes

For using passive solar power the house is warmed by the sun, with larger windows on the north, smaller windows on the south, double glazing, and thermal energy storage that allows it to be released slowly over night and from one day to the next, as well as having eaves to keep the summer sun out, and a deciduous tree to the northwest of the house. The tree can be an important characteristic of passive solar heating, providing early afternoon summer shade, and little effect in winter with the leaves off. Examples of thermal energy storage are where some people will have black tiles in the sunny part of their lounge which will absorb and conduct heat into the concrete under the floor which is insulated, or have heavy walls built or even have in a sunny part of the house columns of water, which can store the daytime heat and slowly release the heat later.

The most extreme example of thermal energy storage is a very thick concrete house built by architect Roger Buck. This has about a two degree temperature change over the whole year because it is heavily insulated with the thermal mass approach. Neil prefers the dynamic approach rather than the thermal mass approach. Well designed and operated passive solar heating can save over 90% of the heating bill every year.

Solar water heating could reduce electricity used in home water heating

For a long time there has been discussion about how much of our electricity is used for hot water in homes. What would be the difference between putting in several thousand solar water heating units in homes instead of building another power station? The 450MW Clyde Dam cost over \$1.7 billion. At \$3,500 for an installed solar water heater providing 4000 kWh of hot water per year, 485714 could have been installed for the cost of the Clyde Dam, providing 1,943 GWh output per year, slightly more than the annual Clyde dam output, and with no transmission losses.

For a thermal power station the capital costs are apparently very similar, and the thermal power station would release more carbon dioxide into the atmosphere.

Self-sufficient houses

There is no real problem about any place in New Zealand having an almost self-sufficient house by using passive solar design and solar hot water, capturing the rain off the roof, and using it for your primary water supply. This has a twofold benefit by reducing the storm water and reducing the water supply requirement. These are just basic design applications.

For the roof to be clean enough for the collection of water, the problem of air pollution has to be worked on. Neil experienced this type of water supply when he stayed with his great aunt, Diana Grant, at Cust. Years ago it was the standard way of supplying water to houses and farmhouses.

If the sunshine, wind and rainfall that arrive at each site are used - the wind for ventilation - this can drastically change the service requirements. There is also the grey water concept. Grey water is the detergent water from the kitchen, the washing machine, the shower and the bath. The question is whether this should go to the storm water or sewer, or be used to flush the toilet and probably to water the garden. If there are toxic substances in the soaps and detergents which are dangerous for the garden then a different kind should be used. Some detergents are good because they can be effective for plant insect control.

It is certainly beneficial to use efficiently and re-use as much of the water as is possible on the site. This can result in a very significant improvement in the storm water and the waste water problems.

All the above material is relevant to having cleaner air, cleaner water, more efficient use of water.

Improvements needed in equipment which is now a health risk

In Neil's view the amount of electromagnetic radiation in homes

could be greatly reduced by relatively simple techniques and technologies, such as putting all radio, television, faxes, phones and internet connections into fibre-optic cables so that the only environmentally radiated fields needed are for mobile phones. They can be made over twenty times safer by putting the handset in a shielded package and using a directional aerial that sends the signal away from the user and by using a hands-free kit connected with a fibre-optic cable rather than a wire which becomes the aerial.

All those technologies are available. Patents have been lodged for them, but cellphone manufacturers are reluctant to use them because it would imply that cellphones are dangerous. However there is already evidence to prove that they are dangerous.

Neil has spoken at conferences and in court cases in New Zealand and in many visits to the US, Europe and Japan, and written numerous articles and submissions warning about the health dangers from electromagnetic radiation caused by [cellphone](#) use and [cellsites](#).

"What we should be doing," Neil declared, "is developing and promoting the technologies and the systems so that we can export them and create jobs around them as we are trying to do with Windpower."

Efficient transport and the clean air problems

One aspect of the Council's work which has been really important to Neil is having more efficient transport which is essential if we are to have cleaner air.

During Neil's first term on the Council he was actively involved in the transport section. He was Chair of the Air Subcommittee, and was on the Transport Emission Testing Committee and on the Regional Land Transport Committee because it was his belief that the air pollution problem came from vehicles. He knew the problems caused by diesel fuel and petrol fuel and kerosene - all the liquid fossil fuels - which were the source of many toxic chemicals in the air including carbon monoxide, sulphur and nitrogen oxide and produced photo chemical smog in places like Los Angeles and Tokyo. Photo chemical smog is caused by the chemical interacting with the sunlight creating ozone and other toxic substances.

Neil had seen the brown smog over Auckland and that is why in Christchurch a voluntary emission testing programme was introduced, led by Neil as a councillor. When he bought the Honda Prelude car, one of the pre-requisites was to take it to the testing station and find out the level of its carbon monoxide and nitrogen oxide emissions. Because it had a catalytic converter which removed almost all of the toxins, the needle did not even move, and Neil bought the car. Fitting converters was a requirement for new cars in Europe, America and Japan from the early 1980s, so Neil bought an imported Japanese car.

The Regional Council encouraged the Government to set standards and bring in new cars that meet those standards. The Council has set high standards for its buses - the Euro 2 standard. The Council controls all the Christchurch city network buses. For new contracts bus companies must put the exhausts at the top of the bus rather than at the bottom where the exhaust is emitted at nose level for the cyclists and pedestrians. As each successive contract runs out the standard is getting better and better, based on the best technology from overseas.

The Christchurch City Council is responsible for the road-based infrastructure - the bus stops, the terminals, bus lanes, and the [Shuttle](#) is a City Council Project, while the Orbiter is a Regional Council project and part of the network. The Shuttle is a City Council service to promote the Central Business District. The Orbiter was set up to give a circular connection to the radial bus system.

"I was brought up with the radial bus system all my life linking Papanui to Cashmere, Brighton to Lincoln Road and Riccarton to Sumner. Diana Shand and I were on the Regional Public Transport Strategy Committee with Dennis O'Rourke and Margaret Murray. As the Regional Council is the Network Manager we worked with the City Council which provides the infrastructure.

"Our staff and the City Council staff worked very closely together. The Regional Council came up with the idea of the Orbiter as a connection for the radial services. A future plan is for an inner Orbiter making an inner circle of transport around the city. Both Orbiters will be coordinated to cross the radial routes at the appropriate times."

NIWA's research made Neil change his mind about the main cause of pollution in Christchurch

In 1996 when the first transmission inventory was done by the National Institute of Water and Atmospheric Research (NIWA) to determine the major cause of the air pollution, Neil had to change his mind because the evidence was that he had been wrong and in winter it was not cars but domestic fires which were the major cause. It was at this point that he switched to using his understanding about efficiency in domestic heating technologies.

Clean Air promotion through the Regional Council/ Environment Canterbury

Neil's job as a Councillor for Environment Canterbury from 1999 was as chair of the Regional Planning Committee which is responsible for developing regional plans like the Air Plan to clean up the air of Christchurch and Timaru, and a Water Plan to clean the water for Christchurch and the rest of Canterbury. Both plans involved the more sustainable and healthy use of air and water. The Regional Policy Statement also requires promoting renewable energy, like windpower, and reducing carbon dioxide emissions.

The air plan prepared in 2002 was taken through the process and put out as the proposed plan based on the principle which Neil had promoted six years ago - the "Cozy Christchurch Scheme". This is the scheme of making homes, especially of the poor, much more energy efficient so that when the heater is turned on the house warms up and the thermostat quickly turns the heater off.

The idea was to have a funded energy efficiency assessment and a scheme to improve the warmth of the home, reduce the power bill, and reduce the need for a burner.

Neil's enthusiastic comment was, "The outcomes would be good for the air and for that family in all sorts of ways. People don't realise that we now know that one of the outcomes would be a much healthier situation for them and their children because it would reduce the electricity requirements of the house reducing the average electromagnetic fields in the house. For the very old homes improving the wiring would reduce the fire factor and by reducing the electromagnetic radiation it would bring other benefits that most people would not think of."

Neil Cherry was instrumental in promoting an air plan for Christchurch cutting through further procrastination.

Proposal for funding the changes

Environment Canterbury is looking at assisting needy people with grants to subsidise or cover the cost of making the recommended changes. This concept was part of the Clean Heat project from its inception.

Under this scheme if people are on the Community Services Card or other government benefits they will qualify for a 100% subsidy if their primary source of heating is an open fire or burner. At the next higher level of income, assistance for part payment will be available. High income families can get free assessment of the house's needs and advice about how to make the recommended changes.

A special rate is to be levied over the whole area of Christchurch which will mean that each household will make a small contribution according to the value of their rates, and this will be sufficient to provide a three to four million dollar per year assistance programme.

Under the original scheme the suggested sum for supporting the community was to be \$15,000,000 over ten years, but now much more support will be offered with a sum of \$38,000,000 over eleven years.

For more information about Neil Cherry's scientific research go to his website www.neilcherry.com

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