Perils in the all-American home

New threats to health, how to greet extraterrestrial visitors and the trauma of taking journalism seriously. Just a few of the topics at the annual meeting of the American Association for the Advancement of Science (AAAS)

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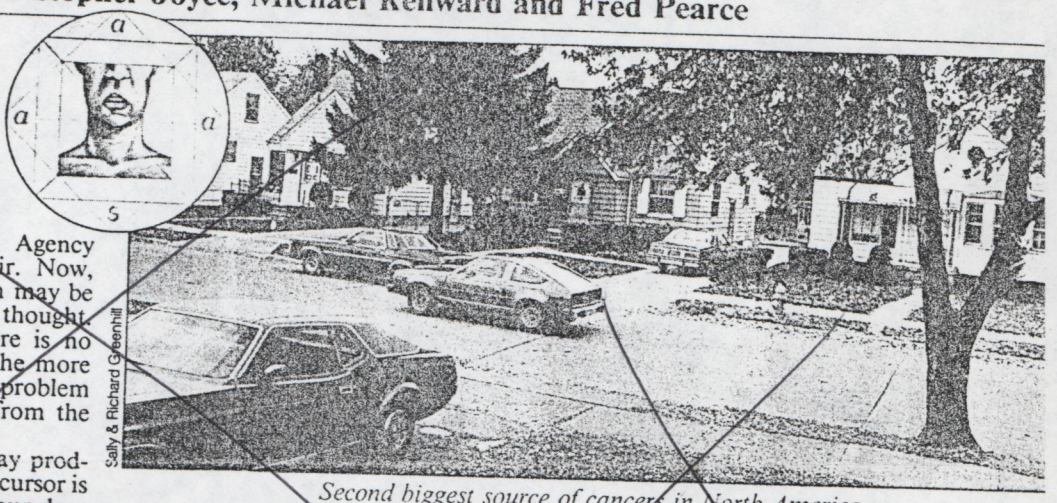

Second biggest source of cancers in North America

FIVE MILLION homes throughout the US may have dangerous amounts of radon gas bubbling out of soils beneath their floors. Some homes built above granite rocks containing uranium have up to 200 times the upper limit that the Environmental Protection Agency (EPA) proposes for radon in air. Now, scientists report, the phenomenon may be even more widespread than they thought. Homes built on soils where there is no recorded uranium are at risk. "The more data we get, the bigger the problem becomes," said Arthur Socolow from the Pennsylvania Geological Survey.

Radon is one of a series of decay products of uranium. Its immediate precursor is radium; radon has a half life of four days and decays to polonium. But radon poses a unique hazard because it is an inert gas that can bubble out of soils and accumulate in houses. A session at the AAAS on indoor radon heard that between 2000 and 20 000 Americans probably die every year from lung cancers brought on by radon. It may be second only to cigarettes as a cause of cancers.

Sweden has been concerned for a number of years about radon seeping from granite gravels, and Britain has recently discovered high levels in homes i Cornwall and around Aberdeen. The stor began in December 1984, when Stanle Watras set off alarm bells one day when h arrived for work at a nuclear power statio outside Philadelphia. He had brought

Beam your clones to the stars

NASA has a programme to look for intelligence elsewhere in the Universe. The Search for Extraterrestrial Intelligence (SETI) has concentrated on detecting radiation in the microwave region of the electromagnetic spectrum. Microwaves started leaking away from the Earth when humans started to play around with electromagnetism and now fill a sphere about 100 light-years in diameter. NASA is developing equipment to allow radiotelescopes to look for microwaves that might be deliberately aimed in our direction from space.

John Rather, a vice president of the Kaman Aerospace Corporation, believes that it may be a mistake to concentrate on microwave radiation at the expense of other wavelengths. He maintains that lasers could be used to communicate through space. Microwaves may produce a better signal-to-noise ratio than lasers at the moment, but "it appears quite likely that it is possible to deliver adequate power for much greater information transfer to many more stars per unit time by using laser methods".

The advocates of SETI favoured microwaves because they are transmitted by human activities and because molecules that are important to life on Earth show up as lines in the microwave spectrum. Rather believes that astronomers should consider looking at laser wavelengths because thay are not produced as "noise" or by natural processes. Astronomers have made many discoveries by looking at wavelengths that stand out from the "normally occuring mundane objects in the regime", as Rather puts it.

Quasars, pulsars, black holes and neutron stars were all found or confirmed because of their distinctive radiation characteristics, not because of their resemblance to ordinary stars. "So building new technologies to examine unexplored regimes, where it has been consistently found that the most interesting objects announce themselves in no uncertain terms, has led to explosive advancement in our knowledge of the Universe."

Perhaps then, any civilisation tha wanted to send a message would pick ar "unnatural" wavelength that will show up with maximum contrast to the natura environment.

Lasers also have the advantage that they can be aimed very accurately at a target, thus making it possible to make better use of the transmitted energy. A well designed laser would be very bright with a high signal-to-noise ratio and a wide bandwidth, giving it the ability to send data at very high rates anywhere in the galaxy.

Rather would like a large bandwidth because it would allow us to send—or receive—far more complex signals. What might we find in any message from space? He talked of sending the genetic code for a "fully educated, functioning human being".

A truly advanced intelligent species might, if it has not blown itself up before it gets that far, "have evolved to a more complex state. It is even possible that they may have developed from organic bodies to some state, such as self-replicating electronic bodies that are much more versatile than organic matter." These people might then squirt themselves into space on a laser beam. The pace of development is such, says Rather, that "there are definite possibilites for achieving data rates sufficient to transmit large numbers of the alien species". □

Smart enough to clone a human, too?

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Used for Paul Whitehead's article "ALIENS, LASER BEAMS AND CLONES"