Q&A: The art of transmutation

James Acord is the only sculptor licensed to work with radioactive materials. Formally trained in nuclear physics, he tells *Nature* why he thinks contaminated nuclear sites should be marked for future generations and explains his obsession with the nuclear age.

Why do you think nuclear sites should be marked?

The land around the decommissioned US nuclear-processing facility in Hanford, Washington state, is so contaminated that it will never be completely cleaned up. Far into the future the site should carry warnings that transcend changes in language and society to discourage people from growing crops there. I would love to produce something of lasting aesthetic significance, both as a warning marker and as a commemorative piece for the advent of the nuclear age. I lived at the site for 7 years but I never really fitted in. Being an artist made me an outsider in a largely engineering and scientific community. I live in Seattle now.

What are you working on?

My attention is on a device here in my studio that transmutes uranium to plutonium. It symbolizes the process that produced the plutonium for the first nuclear-weapon test during the Second World War. Transmutation, which I define as changing the number of protons in any atomic element, is an inevitable tool of sculpture — altering one material into another. In the device (sketched below), I've taken the radioactive element americium —

Sculptor James Acord wants to create artwork to mark the US facility that first produced plutonium for weapons.

A. S. AUBRY

a source of α -radiation — out of dismantled smoke detectors and put it in contact with a small emerald, which converts the α -particles into neutrons. A six-centimetre-thick slab of beeswax then serves as a hydrogen moderator, increasing the chances of transmutation. The neutrons coming out of the beeswax filter go into triuranium octoxide, which is found in a red glaze used in 1940s ceramics. Some of the uranium in the glaze will become plutonium.

Has your work been well received by the nuclear industry?

I confess that I'm disappointed and surprised at how little support I've had. Some of my ideas, such as finding a way of transmuting the element technetium-43 to ruthenium-44, are as great as sliced bread and I don't see why the people running nuclear reactors won't invite me in to use them. There's a sense in the scientific and engineering community that artistic use of the nuclear process is frivolous. But this makes me more determined.

Why were you blocked from using a reactor while an artist-in-residence?

During my 1998–99 residency at Imperial College London, my goal was to use their reactor to transmute technetium to ruthenium. However, while I was there, a couple of nuclear accidents occurred in the world. A senior member of staff said I

couldn't use it: 'absolutely not, we don't want any publicity; we don't want Londoners to know we're operating a nuclear reactor in the city'. I got my nose out of joint about it and made some metal sculptures that said in gold foil 'no access'.

What do you think about nuclear politics?

There's no reason for me to be either pro- or anti-nuclear. We are in a nuclear age, for good or for ill. The physics of the nuclear age is unmistakable and we'll have to embrace more nuclear energy in the future. But the number of people making decisions about it is extremely small. Sculpture, which is an art of technology, should be free to address the technology that is characteristic of our time.

Is your sculpture safe even though it's made from radioactive materials?

Do I think it's safe? Yes I do. Is it legally safe? I'm not so sure. The piece I'm doing now, strictly speaking, is not covered by my licence. The finished work of art, containing both uranium and plutonium, will be slightly radioactive. When I first began removing the uranium-bearing glaze from ceramic tableware, I wasn't very careful about dust inhalation. I suppose it has increased my chance of lung cancer. But at my age I don't worry. Sculpture is a hazardous profession. ■ Interview by **Daniel Cressey**, a reporter for *Nature*.

J. ACORD