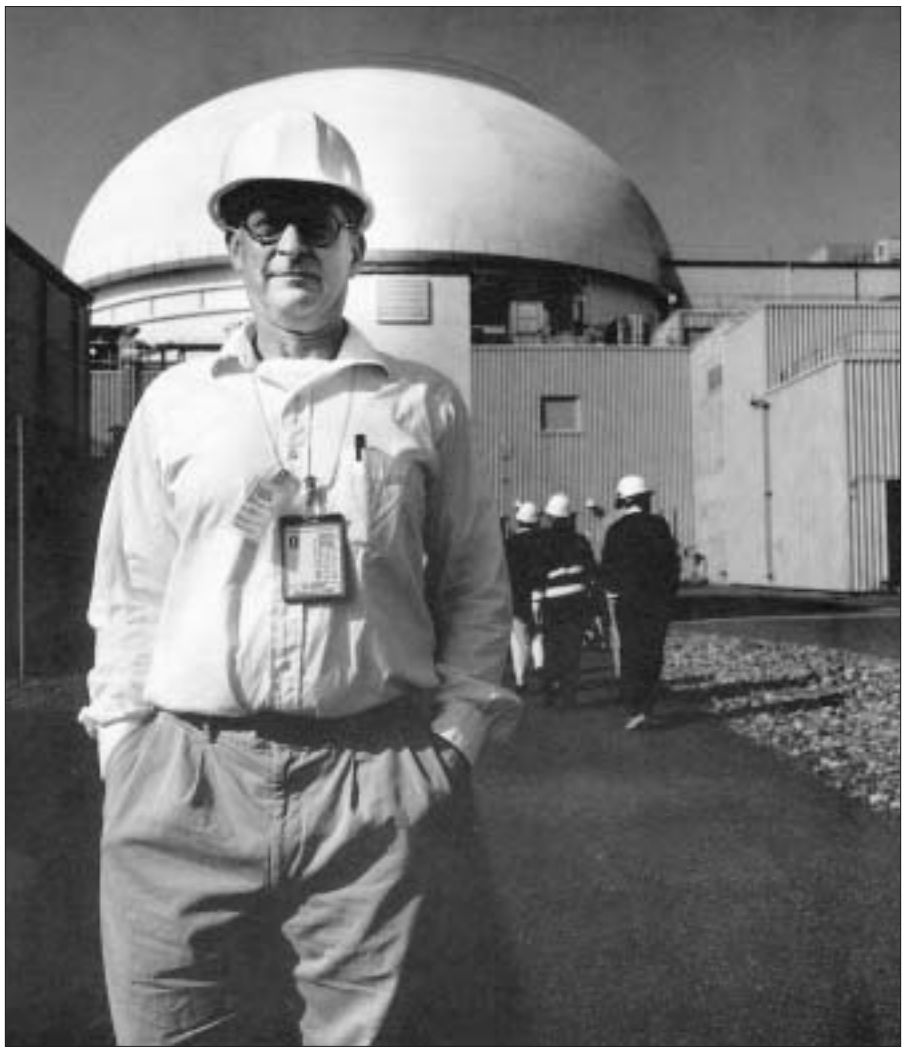
James Acord: Atomic artist

James Acord is a sculptor who works with nuclear materials to express the capabilities of humankind—and maybe change a few minds about the technology.

For many years, sculptor James Acord worked with the same traditional materials that many sculptors work with—metal and stone. A little over two decades ago, though, he decided he wanted to inform his work with the technology of his era, the Atomic Age. "The art of sculpture deals with the technology of our society at any given time—from Ice Age, Stone Age times all the way to the present," Acord said during the following interview with *Nuclear News*. "Sculptors should be making beautiful things from the technology that is available. To me this makes perfect sense. And with my increased understanding of nuclear technology, I couldn't help but think, 'God, there's beautiful stuff to be made here.'"

Others may have been similarly inspired, but no one else followed his nuclear muse with the constancy of Acord. From his artist's enclave in Seattle, he moved to Richland, Wash., near the remote Hanford nuclear reservation, to learn about radioactive materials. He lived there for more than a decade, ingratiating himself into the engineering circles. When he was unable to obtain uranium for his sculpture, he tediously mined his Fiestaware collection. When he was unable to import a donated reactor fuel assembly from Germany, he schooled himself and—with equal parts naiveté and grit—obtained a radioactive materials handling license. He is the only private individual in the world to have such a license. More likely than not, he is also the only licensee to have the number, WN-I0407-1 in his case, tattooed on the back of his neck.



James Acord at the Fast Flux Test Facility in 1992 (Photo: Arthur S. Aubry)

In 1960 at age 15, Acord ran away from his home in Seattle and ended up working as a cowboy on a ranch in Nebraska. A year later, he returned to Seattle and enrolled in what is now the Cornish College of Arts. He caught the eye of his sculpture instructor, who asked him to help with a recent commission for the Seattle Opera House. Preferring apprenticeship to formal education, Acord eventually quit going to classes

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altogether. Within a year, he went to work for another local sculptor, and agreed to a deal for money and space in the sculptor's studio. A career path had also been settled upon: He sold his first work before his 19th birthday.

In the 1970s, Acord became attracted to durable materials for his sculptures. Unlike the more widely used statue materials, such as scrap steel and concrete, or even longer-lasting bronze and limestone, Acord was interested in using stainless steel and granite for his sculptures, both of which could survive corrosive and hostile environments and last tens of thousands of years. In 1979, he moved east to Barre, Vt., a town with a deep heritage in granite (and even a granite museum), to learn to carve a stone that is among the earth's most unyielding.

By 1986, Acord was determined to use radioactive materials in his sculpture. For one particular work he made, *Monstrance for a Grey Horse*—a stark, 1-ton-plus sculpture, in which a carved horse's skull rests on a 5-ft tall trapezoidal column of granite, that he would work on and off for a dozen years—Acord wanted to add uranium to the material mix of granite and stainless steel. According to a two-part profile of Acord published in *The New Yorker* in 1991, he wanted the work to "demonstrate the integral relationship of stone and metal, reestablish the ancient link between art and advanced technology, and prove that sculpture could offer tangible solutions to the problems of society."

The only problem was getting the uranium.

Striking out in his attempts to obtain spent nuclear fuel, Acord turned to Fiesta tableware, the luminous, uranium-glazed dishes introduced in the 1930s. Working in his Seattle studio, he devised a method of separating uranium from the glaze. As proof of his success, he caught the attention of the Washington state Office of Radiation Control, who refused to return a small yield of his Fiesta milling that he submitted for radiological analysis. After a year-and-a-half of wrangling with regulators, Acord was notified by the Nuclear Regulatory Commission that in fact, the pertinent restrictions did not apply to ceramics. He was freed to continue work on *Monstrance.*

"I have to say, in all fairness, I really wasn't very prepared for this," Acord told an audience in London at a 1998 conference sponsored by The Arts Catalyst, an organization that promotes better relations between the arts and sciences. "After all, all my friends were artists. I hadn't dealt with engineers or bureaucrats, really, ever in my life. So, I began convincing them of the fact that sculpture is an art of technology and we live in the Nuclear Age. And, therefore, it is sensible, logical, perhaps even inevitable that the art of sculpture will address nuclear technology."

As Acord went to Barre, Vt., to learn about granite, in the late 1980s he moved to Richland, Wash.—the "Atomic City" and home of the Hanford reservation—to learn about nuclear materials. He turned his attention to the possibility of creating reliquaries, the medieval term for a sculpture that preserves a fragile article of veneration, on the Hanford site.

It wasn't long before Acord wanted to use the Fast Flux Test Facility, a 400-megawatt liquid metal–cooled fast neutron flux test reactor at Hanford (which has since closed and is being decommissioned), to create art. At a conference intended to drum up financial support for FFTF in the early 1990s, Acord gave a slide presentation on his work—the final talk on the night of the main banquet. Alan Waltar, a Past President of ANS who was FFTF's manager of nuclear applications at the time, told *The New Yorker,* "Nobody'd ever heard of this guy, and they weren't all that interested. And then, all of a sudden, about a third of the way into the talk, a hush came down. I looked around and noticed that all the eyes were focused on Acord, and, really, you could have heard a pin drop. You know, unfortunately, a lot of people perceive the nuclear industry as 'cold-prickly' instead of 'warm-fuzzy,' but Jim basically had people eating out of his hand. I had never heard this kind of story before, and I found it, quite frankly, very refreshing, very imaginative."

In the days following the presentation, Acord was offered 12 fuel assemblies—with depleted uranium—from the German SNR-300 fast-breeder reactor, which was completed but never achieved operation. In order to take shipment of the assemblies, Acord needed a license to handle radioactive materials, and his conversation with the regulatory authorities began anew. He eventually formed a one-man company and qualified himself to be chief radiation safety officer. (He had to give himself "surprise" urine drug tests every year.)

"Incidentally, in case there's anyone in this room that would be so foolish as to try to do the same thing, they've slammed every door behind me after I slipped through it,"

Continued

he told the London audience in 1998. "I mean, there are not going to be any more artists licensed to work with radioactive material. That's for sure."

Acord is often seen as a rogue by artists and nuclear engineers alike. One community sees him as giving undeserved honor to an "evil" technology. The other thinks using a reactor to transmute isotopes for a sculpture is folly.

He did not build the reliquaries at Hanford, and eventually left Richland in 1999. Although he calls his undertakings there "a failure," he told *NN* that his time was not wasted. In the following interview, conducted by *NN* associate editor Patrick Sinco, Acord discusses his work, recounts his experiences at the Hanford Reservation, and affirms the allure of using nuclear materials to artistic ends.

How did you first get interested in creating art?

That's kind of a hard one to answer. I've always loved making things. As a child I loved making models. I used to use my parents' toothpicks to make little imaginary cities and stuff when I got home from school. I've always loved making things and creating little worlds. I just knew I wanted to be a sculptor when I was way preteen, that's for sure. And the actual act of creating things with my hands has always been the most important thing in my life. By the time I was in my late teens, that's what I wanted to do, be a sculptor. But I've always loved making things. The art of making sculpture has always been the focus point in my life.

I hear the same thing when I talk to engineers, when they were younger they often liked to build things.

This is part of my reason for having moved to Hanford 12 years ago. I thought, "Wow, engineers—they're just like me. They love to make things. They'll understand what it is I'm trying to do." And there was an upside and a downside to that. Engineers are also hands-on guys, for sure. But, the gap between art and science and engineering was really, really big. And it was very difficult for me to make a connection with the nuclear engineers at the Hanford reservation. They thought of art as being what their bored wives did on Sunday afternoons. They didn't see it as an equally valuable profession. And I'm not putting my thumb in anybody's eye here. It's just that there was a gap there that was really, really hard to span.

I can remember some conversations I had with nuclear engineers in the first four or five years I was at Hanford that were unbelievable, in a way. I wanted to utilize the advanced technology that is associated with nuclear science and engineering. That's what I moved there for. And, they were going, "Why bother? Nobody in the art world is going to understand what you're doing. If you're using 316 low-swell stainless steel or if you're doing neutron capture transmutation—nobody's going to be able to tell. Why bother?"

And, believe me, I have to tell you, I made a lot of friends with nuclear engineers at Hanford. We went to the same church. We went to the same yard and bake sales. We helped the volunteer fire department raise money. I did my duties with the American Nuclear Society's local chapter. But, the gap, the chasm between art and nuclear engineering was just so broad, very, very few people could span it at all.

Why is science important to art, and art important to science?

They're the two parallel paths on which we human beings seek the truth. This goes back 30 000 years to the Ice Age. When our shadowy, forgotten ancestors were struggling to get out of the caves and create civilization, art and science were the two ways in which we tried to find out who we were and what we were doing and what this world was about. And in a marvelous and wonderful way, it has led to quantum theory on the science side of things and it has led to avant-garde art on my side of the fence. But they are parallel. They are the same things. They're just two spokes going into the center of the karma wheel.

This is what we human beings are about. I'm not positive on this, but we are the only creatures on this planet that think in this sort of abstract way about what's going on and what our lives are about. And there are two ways in which we try to determine what's going on: One's art and one's science.

I couldn't help but think that nuclear sci-

Acord signing a receipt for uranium breeder blanket assemblies at the Siemens facility in Hanford, Wash., in 1993 (Photo: Arthur S. Aubry)

ence—the actual working with elemental substances—and the art of sculpture were a parallel deal.

What about nuclear science speaks to your artist's instinct to create beauty and reveal truth?

When I was a child I had one of those little science kits. It was a little nuclear science kit. It had a little bit of germanium in it and it had a scintillator. I could sit in the closet and watch the little photons come off the scintillator, showing what radioactive decay was. I was fascinated by that.

Now, fast forward 40 years from that period. I went over to Hanford and I started taking classes at the Tri-Cities graduate center. I took Introduction to Nuclear Systems and Radiation Protection, Principles, and Instruments. And I realized the actual capability of transmuting one elemental substance to another was a possibility—neutron capture, right? And I have to tell you, it just totally blew my mind. I realized that all those sharp wood chisels and stone-carving chisels and everything I had in my toolbox—wow, there is a new chisel: neutron-capture transmutation, one elemental substance to another, an age-old dream of mankind. You can go back to the ancient Greeks and medieval alchemists. What a perfect tool for sculpture. That's what really got me hooked.

I have to tell you, when I first moved over to the Hanford Reservation, it was a time when this was an extremely contentious deal. Hanford was one of the three locations being characterized for the potential storage area for America's high-level radioactive waste. There was a place in Texas and, of course, Nevada. And all my artist friends, environmentalists, everybody, were showing up at the public hearings, going, "No, don't bring nuclear waste to Hanford." And I couldn't help but think, well, we have to deal with this somehow. Maybe I as a sculptor, as an artist, could bring something to resolve this issue.

My first thought, of course, was I can do long-lasting, weather-resistant warning markers. That's what brought me to Hanford to begin with. When I got there and I started taking science classes and I met physicists and engineers, that's when I realized that the actual utilization of nuclear technology to create art is the best idea I've ever had.

Sculpture is primarily a visual art, but most of the characteristics of radioactive materials that you're interested in can't be seen with the naked eye. How do you reconcile that?

I'll tell you. The transmutation of one elemental substance to another is extraordinarily significant. I mean, that's sculpture. And if it's only 100 atoms a second and if I only have a limited time in Rutherford Appleton Laboratory's linear accelerator [in Oxfordshire, U.K.] or a BNFL reactor, or if I do it with americium-241 source material out of smoke detectors mixed with beryllium—I can do this, transmute one material to another and create a work of art.

Acord assaying the breeder blanket assemblies at Siemens, in 1993 (Photo: Arthur S. Aubry)

You have to realize this: Sculpture, as an art form, deals with metaphor and symbolism. It doesn't have to be a big deal. Yeah, sure, I carved 1-ton chunks of granite and they looked really good and everybody thinks they're really cool. But, to utilize technology to transmute one substance to another, I only need to do a couple of thousand atoms. And then put it into what I call a reliquary—and I'm basing this on medieval iconography—and allow people to be able to understand that we human beings now have the capability to transmute one substance to another. That is the sculpture.

But I have to actually do it. This is what's been the hang-up. They were going to let me use FFTF for transmutation, and everybody backed out. I went to Imperial College [of Science, Technology and Medicine, in the U.K.] to use the CONSORT reactor, and everybody backed out. This is a real controversial thing. People in the nuclear industry think it would be a *frivolous* use of their technology to allow me to create a work of art with it. And this has been the sticking point.

But, you have to understand, I feel that art is as important as science. These are the two parallel paths through which we seek knowledge and understanding of what the human state is like. I'm going to do this. And it actually looks like I'm going to get to do it.

That's good news.

Yeah, well, it is. Sometimes I feel like I'm in over my head. But after doing two artist-in-residencies at Imperial College, I'm sure I can pull it off.

I do have to say, I've gotten to know all the people at Blackett Laboratory. And they were a great bunch of scientists. And the guys down in the shop where I was actually making the sculpture, they were a great bunch of guys. Britain is so different than Hanford.

The only thing of it is the director of the CONSORT reactor would not let me use the reactor. And the reason was that he did not want any attention attracted to the reactor. Certainly, when I create a sculpture using neutron capture, it's going to attract a lot of attention. And that was the hangup on that.

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I have to admit, I like Dr. [Simon] Franklin [director of reactor operations at Imperial College]. He's a good guy. I backed my slide projectors up to the reactor and showed him slides. He and the staff and everybody just thought I was a *cool dude.* But when push came to shove, he said, "Look, nobody in London knows I'm running a reactor . . . on the outskirts of London. And if James Acord does this sculpture, everybody is going to know there's a reactor running right here."

I know I digress from that question, but that's the deal: It is very, very difficult for people in the sciences to understand what I'm actually offering is a better understanding of nuclear technology. The utilization of nuclear technology in the fine arts is the best thing you guys can possibly have. But everybody's going, "'Atta boy, 'atta boy—but I can't get involved." This goes back 12 years ago to the Fast Flux Test Facility reactor in Richland.

One aspect of the nuclear industry is that it's so specialized, the material can be so radioactive, and the processes are so mind-bending to normal people, that it suffers a bad reputation in some circles. Do you see your work as an attempt to demystify radioactivity?

Yes, exactly right. What I am doing is bringing a clearer understanding of nuclear industries and what we human beings are doing. We are in the Nuclear Age, like it or not. I'm sure I don't need to tell you [that] what people don't understand, they're afraid of. What they're afraid of, they're angry at. And that's been the whole deal on this whole nuclear issue.

But in the utilization of nuclear technology for the creation of fine art, for the creation of sculpture, everybody will benefit. There will be a greater understanding. You'd be amazed how few people in the nuclear science and engineering community have understood that. But, over the 12 years that I've been lecturing, exhibiting, and working on this issue, there finally are a few people who are understanding now.

So, you see your work as taking something that some people may see as ugly or horrifying and making it beautiful or in some way redeeming it.

Yes, exactly right. And you have to understand where I'm coming from on this. The art of sculpture deals with the technology of our society at any given time—from Ice Age, Stone Age times all the way to the present. Sculptors should be making beautiful things from the technology that is available. To me this makes perfect sense. And with my increased understanding of nuclear technology, I couldn't help but think, "God, there's beautiful stuff to be made here."

Acord viewing his sculpture *Monstrance for a Grey Horse,* in 1998. The tattoo on the back of his neck is his radioactive materials handling license number. (Photo: Arthur S. Aubry)

I know I kind of brushed on the fact that I've taken a lot of knocks from the nuclear engineering community, who thought that what I was doing was frivolous and of no importance. But, on the other side of the coin, I'll tell you this: A lot of people in the arts and environmental community think what I'm doing is totally evil, that I am giving undeserved credibility to nuclear technology.

But, I hew to the line here. I'm a sculptor and I have a belief of the importance of the fine art of sculpture and I think what I'm doing is a great idea. And that by creating beautiful artwork utilizing this advanced technology, the whole world will be a better place. There will be an increase in understanding, and that's on both sides of the fence. There will be an increased understanding of art for all those hard-baked chemical engineers over at Hanford. And there will be an increased understanding of the value of nuclear technology for all those dimwit Greenpeace people on the other side of the fence.

And, I mean, I've just never been able to let go of this, boy. I've poured a lot of my life into this.

I'm sorry. I keep digressing.

No, you weren't at all.

[Laughs.] Well, you have to realize this: I'm a sculptor; words are but a second language to me, okay? And I mean that truthfully.

How do you plan on using the material?

You have to realize that the quantity that I will be producing is minuscule. It's going to be really, really small. Everybody's shying away from doing the chemical separations, so I'll probably have hundredths of a gram particle wrapped in a gold foil, locked in lead, which will be in a lozenge the size of a coin. The sculpture then can be 3 ft by 2 ft and it will be like a medieval reliquary. It will be displaying the fact that we human beings have the power to do transmutation through neutron capture. So, the actual material itself really is a metaphor and a symbol, it's not the direct material with which I'll make it.

I've got a *Fourth Reliquary,* which I'm planning on doing. It will be out of low-swell 316 stainless steel. It'll be nicely fashioned and will have a shape that describes everything from the Venus of Willendorf to nuclear technology. But all it's going to

have is a postage stamp–sized bit of metal bounded as if it were the Holy Eucharist—a monstrance—in the middle of it.

You're the opposite of the sculptor who works with found materials because you have to work so hard to get the materials that you want to work with. It would be much easier to work with soup cans or hubcaps. What keeps you at it?

Well, basically, it's just that once I had the understanding of the power of transmutation—to change one elemental substance to another—for the creation of a work of art, I couldn't let go of the idea. And, believe me, carving granite isn't easy. I've done a lot of granite carving and I'm famous for it. I've worked in foundries. I've done some great castings. I've worked in clay. I like clay. Clay's wonderful, it's like a primal substance. Your and my shadowy, forgotten ancestors, probably 40 000, 50 000 years ago, were making stuff out of clay and setting little figurines up on ledges in our caves. That's all a part of it.

But, the ability to change one elemental substance into another and create a work of art: Once I understood that capability, it was like a silver bullet right into my forehead. I have not been able to let go of it. And it just turns out that this is an extremely difficult, complex thing to do, for a host of reasons. The art world hates me. The nuclear world doesn't trust me. You don't just walk in and rent a nuclear reactor.

But, I've never lost faith. This is the thing. I've done some granite carvings that took me over a year to finish. It takes a perseverance. It takes a dedication. You know the shape that's coming out of that granite, you just stand there and you carve and you carve and you carve and you carve. And it's winter and your hands are cold, and it's summer and its 100 degrees and you're sweating like a hog. But you get the job done. Well, it's been the same way with my desire to do a transmutation for a work of art. All right, it hasn't been easy.

Incidentally, I'll add this as an aside. Some people think I planned my life out in advance. Not a chance. Once I decided, "Wow, transmutation. This is it. I'll do this," I did not consider the politics or the economics or the complexities of this job *at all*. I just got started on it. But, once you get started on it, you don't quit. It's like doing a granite carving. You work on it until it's done.

Most people would have given up by now.

Yes. And they would've been smarter than me in some way, I think. But, that's what I've always brought to my art. I think that's one of the reasons why I do have international respect on my art work. I exhibit in Slovenia and England and Germany and Rome. People go, "Wow, this guy's for real."

What's your current inventory of radioactive materials?

I have 12 breeder blanket assemblies from the SNR-300 German reactor, which was going to be a fast reactor that was actually going to produce electricity. They're depleted uranium, and I've got them stored at Advanced Nuclear Fuels at Hanford.

I have a very large inventory of Fiestaware plates. And I've actually used some of these in some of my sculptures. One of the reliquaries I did had a salt and a pepper shaker of Fiestaware in it, behind glass with the wire screen in it.

And, of course, I have a small collection of discarded smoke detectors. They're americium-241 sources. I would say I've collected around 100 americium-241 sources in the smoke detectors. If push comes to shove, all I have to do is push over a jewelry store, steal some emeralds, and crush them up and mix them with the americium source material and I've got a neutron source as good as I'm going to get.

That doesn't sound like too much trouble.

[Laughs.] You have to realize I'm not making this stuff up. I mean, this is my life. I'm getting by selling drawings. There are some people out there who are supporting me, and it looks like I'm going to get an artist-in-residency at Oxford University. In

that case I won't need the smoke detectors and I won't need to push over the jewelry store for the emeralds.

Have you been concerned about any cumulative health effects from handling the radioactive materials?

No, not really at all. Listen to me clearly on this: As a sculptor, everything I do is hazardous. The granite dust that leaks through my mask gives me silicosis. I'm working in foundries and there're cadmium fumes boiling off the crucible when I'm pouring bronze.

"Once I decided, 'Wow, transmutation. This is it. I'll do this,' I did not consider the politics or the economics or the complexities of this job *at all*. I just got started on it."

Everything is hazardous. If you want to make things, if you want to create things, everything is hazardous. When I took Radiation Protection, Principles, and Instruments, I realized that with the simplest care in the whole world, working with radioactive source materials such as uranium or plutonium is safer than half the jobs I've had in my whole life. If you want to go out there and make things, you're running a constant hazard and you're probably using up days or weeks of your life.

I remember when I was doing some small sculpture back in the '60s, I used to order a certain kind of silver solder from a jewelry supply outfit on the East Coast. I used it on a regular basis for a couple of years. And, one day, when the package came it had a new label on it. It said, "Contains cadmium. Use only in an open environment." I'd been using it for years, the same silver solder. They just upgraded the safety requirements of labeling that stuff. Well, I'm not sorry I used that. I made some really nice sculptures and I know one museum and some private homes that some of those little sculptures are still in. All right, I realized I was supposed to keep the window open when I soldered with it. And I took that precaution. Granite dust gives you silicosis. It's a bad deal. But, hey, I would rather wear out than rust out from old age.

And as far as working with radioactive materials goes, it's safer than most of the stuff I work with. I have had tours of a dozen nuclear reactors, both here and abroad. The safety implementation is so great in working with radioactive materials. When I've gone to hot labs, when I've been in the 300 Area with the strontium and cesium and the 20-foot-deep water baths glowing away, I was safer there than when I was cutting tombstones in the granite shed in Vermont.

How did you go about becoming the only private individual to obtain a radioactive materials handling license?

Well, I'll tell you this, I slipped through the cracks and the cracks are closed [laughs]. They'll never do that again.

Nobody had ever tried it before. You go to the library and you look all this stuff up and you put it in an application. They [the Washington state Office of Radiation Control] stalled a little bit. They didn't really want to do this. But, because of some of the classes I had taken at the Tri-Cities graduate center, I did actually meet the requirements. Because of Radiation Protection, Principles, and Instruments, I qualified as an RSO. And, because of taking Introduction to Nuclear Systems, which is a 600-level nuclear engineering class, I had the background necessary to get this license.

And I have to tell you, I'm sure that a lot of people wished that this hadn't come to pass. But I met all the requirements, which were always set up for universities and schools and medical research facilities. They never expected a sculptor to walk in and get it. And I do have to say that's pretty cool.

Why did you have the number tattooed on the back of your neck?

Again, let's go back to the art-science thing here for a minute. This was an artist doing an art project who slipped into the world of nuclear science, got a radioactive material handling license, and, as an artist, got it tattooed on the back of his neck. And that became something exclamatory, something of importance. I wasn't doing it to embarrass the nuclear industry or the nuclear regulatory community. I was doing it as a way of trying to bridge between art and normal human life and the complexities of nuclear technology. And I think it was a cool idea and I'm really glad I did it.

"And as far as working with radioactive materials goes, it's safer than most of the stuff I work with."

How were you received in Hanford, which is not exactly an artist's haven.

No, it's not. It's a hardship outpost. Any time artists—my wife was a painter; we were both artists—leave a large urban area, you cut yourself off from much of the financial wherewithal of being able to support yourself. And, boy, I'll tell you, Richland was not a place to be an artist. I could've moved to Chad or Zambia or something—that might have been tougher than Richland. But, Richland was tough.

I do have to say, too, that I don't regret a moment of the time I spent there. I lost a lot of skin off my elbows and knees and chin while I was there. It was tough in a hundred ways, but I learned so much. I wouldn't know what Heisenberg's Uncertainty Principle is, or why Schrodinger's cat was in the box if I hadn't been there and learned about physics and learned about engineering.

At the local community college there over in Pasco, I gave a talk at the engineering society of the welders. They invited me to come over there and teach classes. I learned how to weld zirconium and titanium—hey, you don't learn that in art school.

I really don't regret a day that I was there. Much of the knowledge that I have, with which I will be creating my sculpture in the future, came from that 12-year residency at Hanford.

When did you leave Hanford?

Leaving is a relative term. I would say it was '99. There was a fire and my studio burned. I was also already two years behind in the payments on it. It wasn't working out. And failures are sometimes not a single line on a calendar. They're spread out over a couple of years. I guess I do have to say it was a failure, but I tried my best and there were a lot of people in the Hanford community who also tried their best. But, financially, it was not a viable deal. I was having to go to England to earn enough money to come back and try to get caught up on payments on the studio. It just wasn't working.

What artistic possibilities do you see for Yucca Mountain?

Too numerous to mention. The concept of permanent nonliteral warning markers, or explanation markers for a long-term radioactive waste repository has got to be the *coolest* project that any sculptor could ever work on.

And I've been thinking about that. I do school projects with kids when I'm in London, and that's one of the most-often-brought-up projects I give them, to do warning markers for a radioactive waste

repository. I say, "All right, no language. Let's design warning markers that will warn people 10 000 years from now, after everything else in our civilization has changed." And I get some of the greatest stuff. These kids do a wonderful job. I say, "No words. Language will have changed. It's got to be image only." This is one of the coolest sculpture projects of all time.

Think, we have images from civilizations from which we have no written words. And to be able to do that to last into the future, this is just too cool. We're talking carved granite and stainless steel and other stuff that's going to last thousands of years. But do it with images only and not words.

I don't keep a lot of the stuff, but I do have a stack of drawings from some of the students that I've had who have just turned in brilliant work on this.

And, you have to realize, it's a compelling and fascinating problem: Nonverbal communication to last thousands of years.

It makes you wonder what that image would be.

I've got about a dozen of my own and I've got two dozen of them by brilliant art students from the Royal College of Art, Chelsea School of Art, Saint Martins, and the University of Nottingham—the places where I lecture when I'm an artist-in-residence at Imperial. And, I have to tell you, this is a done deal. I suggest we use them all [laughs].

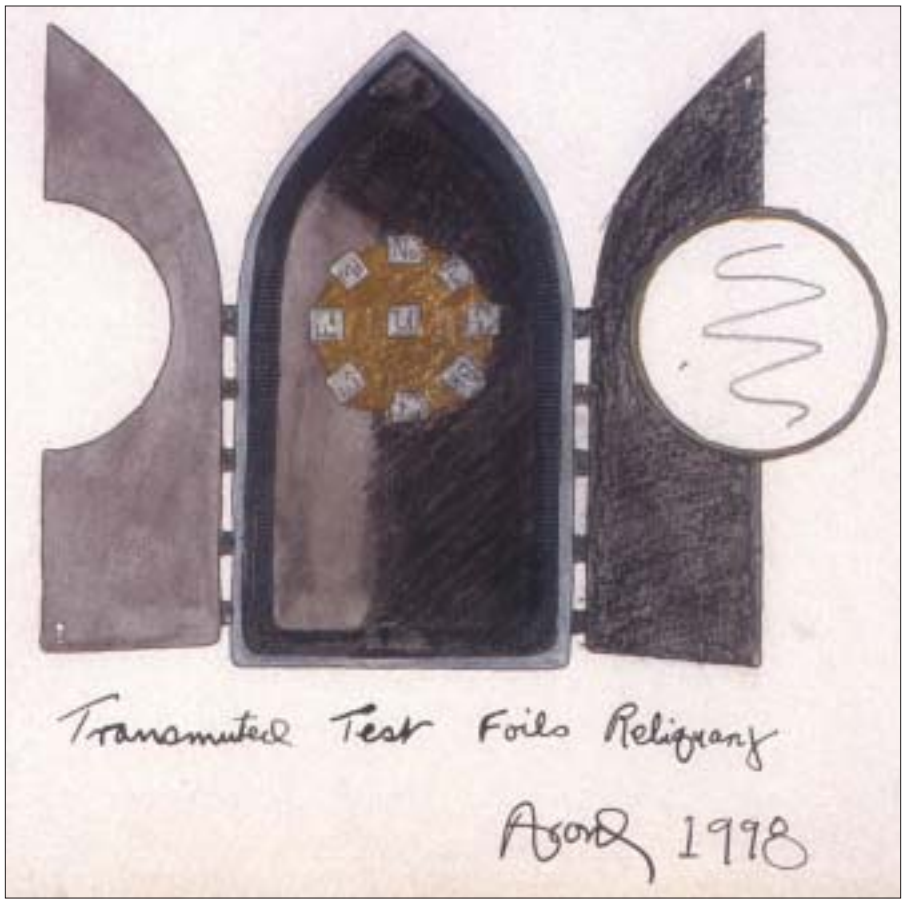
Given unlimited access to radioactive materials and an enormous budget, what would you create?

Again, we're not talking large quantities here. We're talking minuscule amounts. But, we're talking symbol and metaphor, Okay? All right.

I would transmute lead to gold. I would transmute mercury to gold. I would transmute technetium-99 to ruthenium-100. I would also take some plutonium-239 and transmute into something else, and I would like to strip it back to lead. I know neutron stripping is a lot harder than addition, but I also do know that it can be done. And I might do something with taking hydrogen and moving it up to something beyond beryllium, to show that we can start from the most fundamental and simplest element in our universe and make it into something else.

I would say that would be a palette of examples of our human capabilities to change the elemental substances in our universe. I think that would be a contribution that sculpture could make that everybody could understand. And, of course, they would be in fancy reliquary boxes that would look good and hang on museum walls. People could look at them and read the cards and know what went on.

That's what I would most like to do.



Acord's concept for his *Transmuted Test Foils Reliquary* (Source: James Acord)

This is a darker question. If, say, India or Pakistan had followed through on their threats earlier this year to launch a nuclear warhead, with massive nuclear devastation, what effect do you think that would have on your work and on people's perception of your work?

I do think about things like that. You have to understand this, people are either completely against what it is I'm doing, or completely for it. In the event of a nuclear exchange or even a dirty bomb going off in Boston Harbor or something, it's going to polarize things. And it will be either much harder or much easier for me to do this work. I try to put a good face on this and think that people would be more inclined to be supportive of my artwork as a way of increasing understanding. But, also, I know human beings well enough to know that the initial response would probably be real negative.

But, again, you have to understand, the art of sculpture can cut through all this stuff. The fine arts are a way in which we human beings gain understanding and control of complex issues that we only worry about. And, I'm sorry to say this and I certainly don't wish it to be true—it's just a guess—but you and I will probably live long enough to see another nuclear exchange of some sort. It's probably going to be ugly in the extreme.

There is a large circle of humanity that thinks I am giving undeserved credibility and justification to nuclear issues and that I'm the bad guy. And, on the other side of the fence, there's a large circle of people who think that this is a frivolous use of nuclear material and it's going to lead to more bad use of nuclear material.

But, the fine art of sculpture cuts down the center of that line. And, I don't know—we'll have to read the press reports.

Opponents think that using nuclear energy is analogous to Prometheus stealing fire from the gods, and that we similarly will be punished. Proponents, of course, find that harnessing nuclear energy is properly within the realm of human endeavor. What are your thoughts?

That's a really good question and it's probably the most fundamental one that you and I have talked about today.

What we human beings discover and work with and learn about and understand is within the proximity of what we should be working with. We have not stolen anything. We have just learned about it. And, in the process of learning about it, we gained at least partial control of it. We are responsible for how we handle that from here on out. It is within our province, it is within our *métier* to work with this.

The Nuclear Age was going to drop into our lap eventually. We had Einstein, Fermi, Szilard, Heisenberg, Schrodinger. It was going to happen. It's the hundredth monkey thing [see <www.inspirationalstories.com/

0/59.html>—*Ed.*]. Human beings were thinking in that direction and reaching out. This has been a freight train moving down the tracks for awhile. It was going to come to us. We were going to get this knowledge and we were going to have this power to work with things within the nucleus of the very atom itself.

We can go back to Democritus in the ancient Greek times. He was the guy who said, "All right, there's an atom, an indivisible atom." This has been going on for 2500 years. Or, it's probably been going on since we were human beings. We've got this knowledge and we're using it. We've used it for ill and we've used it for good. But the knowledge is not going to go away. So, we need to use it as best we can. This is why I think sculpture can contribute to the understanding of that knowledge. And that will help us use it better. If this be a vain belief, I'm an old dodderer.

What is your reaction to Henry Moore's Nuclear Energy *sculpture at the University of Chicago, which commemorates the site of the first self-sustaining chain reaction?*

I've been there. I've lectured at the University of Chicago and I have seen the sculpture. One, I very much like Henry Moore's sculpture and it is, as is all of Henry Moore's work, a very nice sculpture. Two, it plays on the negative images of nuclear energy, and that disappointed me a little bit. Like I say, it's a beautiful sculpture, but it is so easy for an artist's first response in anything nuclear to go to the mushroom cloud and to death and destruction.

Artists are mere mortals, too. Henry Moore was alive when Hiroshima and Nagasaki happened, and I'm sure that was the image that he had in his head. And that's why it came out in his sculpture. It's a beautiful sculpture, and unfortunately it plays on the negative imagery and iconography of the nuclear age.

Can you describe the thoughts that went into creating your Fiestaware reactor sculpture?

[Laughs.] The Fiestaware reactor was not, of course, a real reactor in any stretch of the imagination. But it was a demonstration. It was a fish tank full of Fiestaware plates and water. The whole idea was to show that uranium-238 plus 0.7 percent U-235 is a naturally occurring material. There have been times in the past when there were even naturally occurring nuclear reactors, when the U-235 rate was higher because of the difference in decay rates. It was in Gabon, Africa. What happened was there was a naturally occurring vein of uranium; water poured into it and apparently this natural reactor went on and off over a period of thousands of years.

The whole point of the Fiestaware reactor was to show that with naturally occurring materials, which we human beings now use as ceramic glaze for beauty on our ceramic tableware, you can add water and, in theory or in demonstration, have a nuclear reactor. I actually thought it was a pretty cool idea. And a lot of people probably didn't get it.

"The Fiestaware reactor was not, of course, a real reactor in any stretch of the imagination. But it was a demonstration."

And that is true, the first nuclear reactor on planet Earth that we know about was a natural vein of uranium somewhere in Africa that, everytime it flooded with water, went critical.

So, the deal with the Fiestaware reactor was, with water and Fiestaware plates, you have this symbolic nuclear reactor.

Where can people see your work?

Okay, well, that's a hard one—that's the hardest one of all [laughs]. I have an exhibit opening in Switzerland in May of 2003. The name of the show is "Atomica." The show will then travel from Switzerland to Berlin, Budapest, Rome, London, and New York. It'll travel for two-and-a-half years. And it's going a couple other places I don't remember.

Is there a place on the Web?

Everybody keeps telling me I'm supposed to be doing that. I'm just not very much of a computer guy. So, I don't have anything on the Web. [Others, however, have put photos of Acord and his works on the Web. See <www.tcfn.org/timecapsule/html/acord_bio.html>—*Ed.*].

What are you planning to do next?

I have a great plan for another sculpture and it's going to incorporate Heisenberg and Schrodinger, and it's going to have a small radioactive source material in it. The sculpture will be totally sealed and you will not be able to see what's going on. But, by turning a hand crank on the side of the sculpture, you will either be activating a nuclear transmutation or shutting it off. This is the *Fourth Reliquary*. And how much trouble I have getting this across international lines remains to be seen.

I'll do that sculpture at Rutherford Appleton labs while I'm artist-in-residence at Oxford University. Or, I'll do it at Imperial College at Blackett labs. I know all the guys there and I've worked in the shop for a couple of years. I'm sort of grandfathered into that gang.

"I have a great plan for another sculpture and it's going to incorporate Heisenberg and Schrodinger, and it's going to have a small radioactive source material in it."

Incidentally, they're the best bunch of shop guys you can imagine, instrument-makers and machinists, all. They all drive vintage motorcycles and they are totally unintimidated by all the Nobel Prize winners who come down and ask them to make stuff for them. I really like Blackett Laboratory. And, I may go back there as well. I'm kind of angry with them because they promised I could use their nuclear reactor two years in a row and kept reneging on their promise. They would like to have me back. I do know the shop guys well.

But, it looks like Oxford and Rutherford Appleton labs will be a better match, although it is only a linear accelerator and not a reactor.

This has been the most interesting conversation I've had in a long time.

Well, I'm sure it's different. When I was able to afford to keep my membership at the American Nuclear Society at the national level, I read *Nuclear News* all the time. And, I know that this is probably a very dissimilar interview than most of the ones that you do.

Just to get serious for one last moment, I do think that art and science working together can make this world a better place. I'm trying to do that and it's through the help of people who take an interest. There are some people who recognize that this is an important thing. We've got to integrate this advanced technology into the common fabric of human civilization, so we can all make good decisions about nuclear waste storage and using nuclear power instead of fighting over the last little bit of oil in Saudi Arabia. And, I can't help but feel that my artwork is going to play some little, small part in helping all this get done. NN