

One of the first artists with whom MT seriously discussed joining A & T was Robert Irwin. Irwin's initial reaction to the idea of working within a corporation was to express skepticism—not about his own ability or desire to collaborate intensively with engineers or scientists, but about the structuring of the program [see introduction, p. 12]. Once the artist was persuaded to visit corporations and sign a contract with us, his involvement developed into a virtual life commitment. Indeed the ramifications of the "Irwin/Turrell/Garrett project" so far transcend the immediate parameters of A & T that it is not possible for us fully to know, much less to document, every phase or outcome of the ongoing work set in motion by the original A & T connection.

In August of 1968, Irwin toured two Patron Sponsor Corporations recently signed with us—Lockheed Aircraft Corporation and IBM. With him and our staff on the Lockheed tour was R.B. Kitaj [see Kitaj section]; they visited Lockheed's Rye Canyon research center, as well as the Burbank aircraft production complex. It was evident even during this preliminary view of a corporation that Irwin, unlike Kitaj, was not interested so much in industrial fabricating techniques as in the more abstract areas of theoretical experiments in perceptual psychology. At Rye Canyon, there was an anechoic chamber (a room heavily insulated against outside noise stimuli and thus non-reverberant), and a chamber into which sound and visual stimuli could be introduced for the purpose of testing human responses to various sensory phenomena. These were precisely the kinds of research facilities to which Bob wished to gain access. According to notes made by Gail Scott following this tour, he asked to locate a Lockheed specialist with whom he could discuss "acoustic coatings—what he wants is architectural acoustics. Wants to do an environment using optics, acoustics, lasers, etc. without any mechanism exposed."

On the IBM tour Bob was accompanied by Cal Tech physicist Dr. Richard Feynman; they spent two days at IBM's enormous San Jose complex. Again, Bob was most drawn to investigate the laboratories researching human responses to special environmental situations. The IBM San Jose facility is equipped to deal in areas seemingly far afield from the production of computers—there are elaborate physics and chemistry labs, for example—and, although nothing came to develop between Irwin and IBM, the tour, especially through his close contact with Dr. Feynman, was an extremely rich experience for the artist.

A match between Lockheed and Kitaj was effected in September but Irwin arranged to consult with Lockheed's Don Christiansen, of their Public Affairs office. Bob drew up for Christiansen a rough listing of tech-

niques and experimental phenomena he wished to study:

Space craft cabin/support environment:
investigations necessary to determine what perceptual awarenesses are necessary for basic orientation and stability.

sound—what kind, how much, interrupted? natural environment noises for attention, sleep, etc.

visual stimulus for attention, orientation, space, sitting

tactile—touch orientation to instruments, space of capsule

how much can be corrected through training or assumed/what kind of training?

what kind of equipment was used to gather this information? Ganzfeld sphere, anechoic chamber, etc.

How was this information applied to the design of the capsule? visual information of instruments, sound information, how much sense of control was built in and not entrusted to the astronauts.

all information where man's sensual awarenesses were tested with conclusions of degrees of awareness/human prowess (sighting of specific objects on the earth) basic necessities for maintaining sanity.

Materials:

Morano

light properties of paint, ceramics, materials with abilities to diffract, diffuse, curve light—high absorption or reflectivity. Materials with special sound properties—deadening high reflectance, etc. how do they protect the men from the sound during liftoff? ability to change any perceptions of sound.

Optics:

any materials with optical properties. diffraction gratings screening materials—diamond or triangular shaped thread. rear screen projection screens, glass or plastic.

gases for flames/optical projection screening lights—xenon, quartz-iodine point sources (as close as poss.)

lenticular screening materials. polarizing any particular surface, wavelength, etc.

Light, color, weight and density in the open air:

Vandenberg vapor trails

chemiluminescence or electroluminescence

coronas and halos and 'glorys'

ice crystals, iron filings

lightning balls—plasma
 visual observation and photos of sound waves
 Schlieren images and shadows images
 electrical fields around the earth—glowing Van Allen
 belts

When he gave us a copy of this outline, he spoke to us about his general intentions, here recorded in memo form:

Bob knows exactly what he is interested in technically (see his own report of his fields of interest), and was very persistent in asking the various experts at Lockheed for specific information. He will carry on himself with Don Christiansen, although he will not be working at Lockheed. He wants to collaborate on a project with Jim Turrell, perhaps at JPL.

Generally Bob is involved with perceptual psychology:

Processes of receiving and reacting to information. He wants to find out more about the application of studies and equipment used in recording people's reactions to light, sound, color, weight, density, etc., before he even starts to work out a project.

We learned at this time that Irwin had been in close touch with James Turrell over the Summer of '68, and that the idea of collaborating with the younger artist on a project for A & T had apparently been in his mind for some time. There can be no doubt that Turrell had suggested to Bob many of the concepts he was exploring with Christiansen at Lockheed and with Dr. Feynman. Significantly, he attached to his outline for Christiansen a bibliography compiled by Turrell of books and articles on perceptual psychology. Turrell, having had considerable academic training in psychology at Pomona College, had more direct access to literature in the field, and had a greater understanding of experimental methodology than Irwin. Bob, however, had for years been intuitively dealing with certain subtle aspects of the psychology of perception through his work. When the two artists met and entered into a period of intense dialogue, they both felt a sense of extraordinary potential—it was as if each had found in the other an ideally complementary source of information. Irwin brought to the relationship his long experience as an artist and his highly evolved esthetic sensibility; Turrell had an intellectual background, and thus a verbal knowledge of theory and technique, which could open wide new possibilities for application by Bob or both artists together. [1, Turrell at left, Irwin right]

When it was proposed to us that the two artists enter into corporation residence collaboratively, we agreed without hesitation. We weren't certain whether Jet Propulsion Laboratory, where they were eager to work, could provide a satisfactory degree of commitment,

since they were not a Patron Sponsor Corporation and had placed definite limits on the extent of time and money they could afford to put into the project.

There was, however, another aerospace-oriented corporation contracted with the Museum as of May, 1968—The Garrett Corporation—which we had not yet matched with an artist. (The young Canadian artist Iain Baxter, and kinetic sculptor Len Lye had both toured Garrett, but nothing came of these encounters.) In November, 1968, it was arranged for Irwin and Turrell to meet with



Tom Vanides, our contact man at Garrett, and Dr. Ed Wortz, Head of the corporation's Life Sciences Department in Torrance, California. This preliminary meeting—attended by us and Dr. Feynman, as well as the artists—was one of the most exciting and spontaneously productive occasions of its kind we attended during the entire course of A & T. It was immediately evident that Dr. Wortz's interests and field of research were precisely parallel to those of the two artists. Wortz has a Ph.D. in Experimental Psychology from the University of Texas. He has been with Garrett since 1962. The nature of his work at Garrett is directly concerned with human perceptual responses in special conditions: the Garrett Life Sciences Department has been importantly involved in developing life support systems for manned lunar flights. Wortz has done considerable research on the problem of actually walking on the moon—this implies such considerations as the astronaut's perceptions of space and perspective when he is near or on the lunar surface, what his physical and psychological tolerances are during various phases of his exertions, etc.

On the basis of several preliminary meetings between the two artists and Wortz, it was agreed to proceed with an artist-corporation match. Artist contracts were signed, and the collaboration proceeded. Irwin and Turrell met