

## Book Reviews

Reviewed by

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### **Space Settlements: A Design Study.**

Edited by R. D. Johnson & C. Holbrow,

National Aeronautics and Space Administration, 1977

Washington, D.C. 185 pages, \$5.00

The progress that has occurred in solving problems concerned with outer-space exploration contrasts sharply with the limited progress we have made in solving problems and questions about inner-space. *Space Settlements* gives an excellent, but brief, review of problems that have been solved and an exposure to different approaches that may be used to solve other problems related to space exploration.

*Space Settlements* is concerned not only with the physical problems of space colonization but the psychological, medical, and social aspects as well. The book is highly creative. Indeed, compared to most books and articles being published, *Space Settlements* is remarkable for showing leaps of creative success that restore one's faith in humanity's ability to solve problems. This is one book that is not to be judged by its cover. Senator William Proxmire did so, and his response was "hogwash."

*Space Settlements* is the result of a ten-week seminar that had to be one of the most intellectually stimulating ten weeks in the Western Hemisphere on space colonization, held at Stanford University during the summer of 1975. The book reflects much more thought and work than could have been accomplished in ten weeks. It is one of the best examples of serial multiple element creativity that is available. The range of questions that have been asked, and are being asked (with some very novel results that may answer the questions and pose a number of possible solutions) vary from the minute to the planetary.

A good example of a technical question is the design for a lunar mass launcher to "shoot" lunar ore to the appropriate Legrangian libration points (locations in space where the gravitational forces of the Earth and Moon are "balanced" so that "a material body placed there will maintain a fixed relation with respect to the Earth and Moon as the entire system revolves around the sun." It is less expensive to throw needed materials to the Settlement from the moon than from earth. Both launching and catching are considered in detail. In one solution, masses will be flung to a mass catcher by means of helium-cooled superconducting magnets suspended above a tract. It's rather like a roller-coaster that

always takes a turn too quickly so that the passengers fall to the same place. A photograph of the model mass launcher that has already been built would have been a nice touch in this chapter. A photograph of an alternate method, the gas gun, would also be quite interesting. The gas-gun throws a bigger payload with less accuracy than the mass launcher. But the mass catcher requires a rotary-pellet driver to maintain position and the gas-gun requires that tugs go and pull in the larger masses to the processing stations. A combination of both methods will probably prove most effective. A number of other solutions are offered to problems such as radiation and meteoroid protection, the amount of simulated gravity necessary, and so on. The solutions offered for the psychological, medical, and social problems are weak and most likely reflect the lack of psychologists, physicians, and sociologists attending the workshop.

Psychologically, changes in states of consciousness will most likely be transient; however, the artificial perceptual changes, such as the visual-illusions suggested to produce an environment that appears non-confined and spacious (but in reality is just the opposite) could produce an air of non-reality that could be damaging over a period of time. It is recognized that surreality may be a problem: "A better idea is to provide contact with the actual environment of space. Convenient access to regions of zero gravity and to views of the Earth, the Moon, and stars would provide stimuli taking full advantage of life in space: it would also provide panoramic vistas, long lines of sight, and awareness of reality beyond the human scale."

The colony that is planned will grow from a few hundred workers to five or ten thousand full-time inhabitants. The plans for the selection of highly screened professionals for the colony leaves the impression that the novelty of individual relationships would be restricted: No hippies, winos, drug freaks, philosophers or members of lower classes need apply. The space colonies will be a stark contrast to the rather criminal never-do-wells that settled much of North America. One of the major problems of the new colony, that of finances, would be greatly reduced by paying minimal wages instead of the exorbitant salaries presently planned. It is worthy to note that in an informal survey of thirty-six professionals, I could not find a single person who would go to a colony to work for even a short period of time. The method of Columbus — "get what and who you can, without too much danger" (S. Morrison, 1973) — may be our answer to the money problems. If this is true, it will probably be a short period of time before the colony declares total independence from earth. At least, the species of man would not perish because of childish arguments over territory. Yet, it may perish for other reasons.

Physiologically, the nutritional solutions of the colony are optimistic, and do not deal with the changes in diet that will be required to prevent steroid and calcium changes. The biochemical problems that result from long-term space flight have *not* been solved. The Russians reported in 1978 that the depletion of calcium had been solved. Research scientists

in the United States have failed to replicate the reversal of calcium loss (NASA, Personal Communication, 1979). If the loss can not be ameliorated, extrapolation from available data indicates the colonists will become invertebrates after 20 to 30 years in space. The answer to this and similar questions may result in the colonists being called "limeys." The English ruled the seas for many years before they found out that limes stopped scurvy. They did not know why it worked, but it did. Similar spin-offs from research on calcium depletion in space may be helpful to earthbound problems, e.g., arthritis, rheumatism, and spondylosis.

The editors clearly recognize and state the problems that need to be solved and conveniently place these in the last chapter. I strongly recommend *Space Settlements* to psychologists and sociologists for supplementary reading in courses that relate humanistic problems to technology. The book would also be a joy to read for an appreciation of the knowledge that we have acquired in order to propose such a bold concept as space colonization.

## **Computer Power and Human Reason: From Judgment to Calculation**

**By Joseph Weizenbaum,**

W. H. Freeman and Company, San Francisco, 1976  
xii, 300 pages, \$6.95

Weizenbaum's book is difficult but rewarding to read. The book is a blend of the pathos of Query's guilt (Graham Greene, *Burnt Out Case*, 1961) and the gallows humor of a man who has not only created a Frankenstein, but observed the damage his creation has, and possibly will, wreak in the future. The guilt underlying this creation coupled with the astute observations of the people who are responsible for the rapid evolution — and psychological revolution — of electronic calculating machines presently being developed is explored. Just as *Zen and The Art of Motorcycle Maintenance* is only "nominally" concerned with motorcycles, Weizenbaum has, for good reasons, posed a number of subjective and intimately personal problems which he encountered while developing a computer program that "parodied" Rogerian Therapy (between a cathode ray tube and a human subject). What is more frightening is that Weizenbaum has seen the potential problems of computer programs developed in parts by a number of independent programmers. The mega-programs operating presently function as a large component of our national defense system. It is basic to the thesis of each of Weizenbaum's arguments that man is *more* than the rational, contemporary, totally