

The Astrosociology of Space Colonies: Or the Social Construction of Societies in Space

Jim Pass

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*Astrosociology.com, and Department of Social Sciences, Long Beach City College, Long Beach, CA 90808, USA
(714)317-6169, jpass@astrosociology.com*

Abstract. For a number of reasons, the construction of a single space colony represents a future social reality strongly likely to play itself out repeatedly as the twenty-first century advances. As early plans are considered, we must take into account that societies on Earth serve to carry out a variety of life functions and, in so doing, must meet the *social needs* of their citizens. While the proper engineering/construction of space habitats is necessary to ensure survivability of the inhabitants of a *physical environment* in space, it remains insufficient to ensure proper functioning of a *social environment* in space. This paper assumes that the physical environment is adequate to sustain life reliably (that is, to provide life support) and focuses instead on issues related to the sustainability of a society in space from primarily a sociological perspective. The astrosociological argument serving as a central theme here is that we must carefully consider research findings of Earth-based societies and their communities and apply the sociological lessons learned to the planning of space colonies. Moreover, the astrosociological perspective can serve to provide a formal mechanism for collaboration between social scientists and space scientists so that construction of a particular space colony proceeds based on the greatest level of understanding possible.

Keywords: astrosociology, human factors, social environment, sociology, social sciences, space colony, space society.

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INTRODUCTION

The ambitions for this article must remain rather modest because the area of study known as the *astrosociology of space colonies* (or space societies) formally begins here. Due to the relative novelty of the sociological treatment of this topic, this article represents a preliminary examination of *some* of the sociological issues involved. It represents a foundation on which other astrosociologists can build. While I do not pretend to offer the first article in this field by a sociologist, I do claim it as the first formal *astrosociological* effort. For this reason, this initial treatment purposely touches on pertinent issues in a general manner.

This approach focuses purposely upon sociological principles, conceptualizations, and research findings in a few key areas that currently indirectly relate to communities in space. The intent is that a sociological perspective provides new insights into the social construction of such communities and furthermore demonstrates the value of this approach as an adjunct to current efforts in this area of research and planning. Accordingly, this appeal argues for space scientists and engineers to incorporate sociological knowledge into their plans for space colonies partly by inviting astrosociologists to participate.

For the reasons noted above, it is best to view this effort as a preliminary survey of the essential issues related to what a sociological approach can add to the preliminary knowledge and achievements gained for decades by engineers and scientists working in the area of space colonies. While not an exhaustible treatment of the subject, it serves to demonstrate the need to bring in sociology and the other social sciences into this area of study.

Assumptions

Little doubt exists that solutions to moving large numbers of people, infrastructure, and supplies in space are forthcoming. Advancements in science and technology within the “hard” sciences move us ever more quickly in that direction, including the ability to produce essential in-situ resources essential for survival (e.g., oxygen, fuel, building materials, power). Thus, this essay assumes that such problems require solution before the journey can begin. It purposely neglects other considerations, as important as they are, such as the physical environment (and which type is best), legal issues associated with property rights and the like, funding, and the very feasibility of constructing such an outpost. Migration to near-Earth space and eventually the stars serves as an implicit assumption. Moreover, this essay excludes discussion about whether such projects in space are culturally valued. It assumes that they are. Instead, the focus here remains firmly placed on the social and cultural issues related to sustaining a thriving population. Planning for the issues and problems that inevitably arise must receive consideration by all types of scientists at the earliest stages of the project.

Moreover, let us assume that this hypothetical society exists far from Earth in order to ensure its isolation in the minds of readers. There is not the possibility here of a quick rescue from Earth. The colony must fend for itself. It must socially construct new social adaptations to unexpected problems that arise. In other words, placement of the focus is squarely on the space society itself from a sociological perspective, an approach that while critical, exists relatively uncommonly among scientists studying issues in this area of research.

If we truly intend to develop a space colony, we should remember one fundamental rule: *construction of the social environment is just as important for survival as construction of the physical environment*. The *social construction* of a space colony refers to the idea that settlements in space involve the creation of a social environment in addition to the physical environment. Consequently, the major concerns of this essay focus upon the consideration of the *social environment* created with the establishment of the space society. This additional focus will be healthy for the entire project. As becomes evident, planning by *all* types of scientists for the issues and problems that inevitably follow ensures the greatest likelihood of success.

Thus, the focus of this essay centers upon sociological concerns related with social life in an isolated social environment located in outer space. The specialty of space societies is likely to become a popular area of specialization within the field of astrosociology, so this early treatment of the subject seeks only the modest objective of laying out some of the major issues relevant from a sociological/social-science perspective.

Astrosociology as New Subfield

The definition of astrosociology is the scientific study of *astrosocial phenomena*, or social and cultural patterns related to outer space (Pass, 2004c; Pass, 2004b). One may view it as the “sociology of outer space.” All social and cultural patterns related to space conducted both in space and on the Earth fall under its purview. Currently, the greatest percentage of astrosocial phenomena occurs on our home planet. However, this will change as our efforts in space continue to push farther away from terrestrial soil.

Astrosociology is a new subfield within sociology that currently finds itself at the outskirts of respectability within that discipline (Pass, 2004a). Currently, greater support exists within the other social and behavioral sciences, and the humanities (e.g., psychology, political science, anthropology, history). Nevertheless, the value of this essay lies in the central argument that the social sciences are vital for the successful implementation of space projects that involve complex social environments and these social environments deserve recognition as vital aspects of the design of such projects. Furthermore, as Marilyn Dudley-Rowley (2004) observes, there still exists a great disconnect between the social sciences (especially sociology) and the space community; a social reality that requires immediate attention.

Again, something akin to astrosociology is not a new idea. For example, sociologists B.J. Bluth (1983), William Sims Bainbridge (1991), and Alvin Rudoff (1996) all called for a sociological approach long ago. Nothing notable came of

their efforts, until arguably recently with the introduction of astrosociology two years ago. Outside of sociology, anthropologist Ben Finney (1985) wrote 20 years ago that even a moon base represents a social challenge as well as a technical one. Nevertheless, a formal organized sociological approach still does not exist. To reiterate, the *social environment* must become equivalent in importance to the physical environment defined as the structure of the spacecraft during long missions or the colony (e.g., life support and the other engineered systems) as projects become increasingly complex due to the sending large numbers of individuals into space.

Multidisciplinary Approach

An initial realization from a sociological perspective is that space societies represent isolated social groups dependent upon life support systems beyond the confines of the Earth's biosphere. There is no doubt that the physical environment must be capable of reliably maintaining life support as well as protection from space-bound threats to human life such as radiation. Two camps of people exist which are necessary for the successful operation of a space society: (1) the engineering/physical science camp (i.e., the space community) and (2) the social science camp. The former is traditionally involved with the study of space colonies. The social sciences, with the exception of sociology, participate far less frequently and with much less organizational prowess than the former.

Consequently, a major focus on the social environment requires bringing sociology and the other social sciences into the mix in addition to developing astrosociology as a banner under which sociologists and all interested scientists can collaborate in an organized manner in order to build a coherent body of knowledge and related literature. Formal collaboration between astrosociologists and space scientists/engineers can serve to provide all those involved with a well-rounded understanding of all the issues involved with constructing a space society.

Sociology and the other social sciences must gain access to that element of the space community focusing on space colonies. A multidisciplinary approach is vital to successful establishment and functioning of any space colony. As Harrison (1997) pointed out in the concluding chapter of his book entitled *After Contact: The Human Response to Extraterrestrial Life*, while traditionally separated and suspicious of one another, scientists from the "hard" sciences and "soft" sciences must work together in order to achieve the most comprehensive and well-rounded perspective. Since proposing astrosociology and founding *Astrosociology.com* in July 2003, I have always advocated it as a multidisciplinary approach in which the social science and space communities could come together for collaboration under a single banner (Pass, 2005a, 2005b). Perhaps no greater area of space exploration requires sociological input than that of space colonies due to its very nature: placing an isolated society in space that must ensure its own ongoing survival without reliance on Earth.

Presently, this appeal for formal collaboration faces a difficulty, as described earlier. To some extent, astrosociology requires acceptance from within the discipline of sociology as a mainstream subdiscipline. Efforts in this direction already continue to show progress. Furthermore, collaboration with other scientists outside of sociology will undoubtedly force the sociological community to view astrosociology as more legitimate. This multidisciplinary approach may prove in the end to catapult astrosociology into acceptability among all involved in the study and planning of space exploration. This is the goal.

HUMAN SOCIETIES IN SPACE

Innumerable considerations exist concerning the subject of societies in space. This treatment represents a survey of some of the sociological issues that we should all start to contemplate from this point forward, as they remain vital to the success of the social construction and survivability of any space society. Hopefully, this overall discussion will stimulate an increased level of interest in the social environment and thereby a greater level of attention on it, leading someday to its evaluation as an important field on an equal footing with the physical environment.

Definition of Space Society

The concept of “space society” represents a vital expansion of the current tendency to focus on engineering and the physical sciences to solve problems associated with the planning for a successful space colony. Again, the social environment must not be left to chance or else failure is the most likely outcome. Sociologists define a *society* as something similar to a population situated in a particular territory that shares a common culture and serves to carry out the major functions of life. In contrast, a *community* relates to the collection of primary and secondary groups within which an individual actually carries out these important functions of life. In part, whether a colony characterizes a community or a society depends upon its population size as well as the makeup of the members of the population.

On another level, “space community” represents a good concept because it speaks to the idea that community life is vital even within a large population in space. That is, community must exist at some level within the overall social structure to ensure the survival of colony citizens. In fact, we must seek to establish viable communities within the colony if its population is too large. It remains vital to put into place the social relationships characteristic of communities, as part of an organized social life, and not just focus on the well being of individuals, so that we allow for the possibility of a successful colony. For this reason, the concept of community must be considered throughout the planning process lest we become complacent about the possibility of constructing an impersonal social environment unable to carry out important life functions.

For present purposes, *space society* is defined as a space colony/settlement in which members of the population (1) share a common culture, (2) live within a closed physical environment, and (3) cooperate with one another, social groups, and institutions in order to meet the social needs of all its citizens. A space society may be small or somewhat larger. However, the greater the population size, the more impersonal the social system. It becomes characterized by more secondary groups and fewer primary bonds. When the population is too large, therefore, community structures will establish themselves within the overall space society (i.e., large colony). We should promote this process. Thus, while the overall colony deserves great attention, so too do the community structures within it.

Rural Community vs. Urban Society Model

An ongoing discussion in the space colony literature relates to the initial population size. There is probably no perfect resolution to this debate when considering it alone. It seems related to another question. What are we trying to accomplish? In other words, are we sending a crew or a larger population more characteristic of a community or society? Thus far, our experiences related to living in space are characterized as *space crews* rather than *space societies*, or even communities. Space crews consist of a relatively small number of individuals performing occupational tasks under the employment of national space agencies. The durations of their space missions remain relatively short so that a nearly single-minded focus on occupational concerns, though stressful, remains manageable. However, as missions involve larger numbers of non-professional participants, longer time spans, and the impracticality of mission aborts, then we must begin to view the social environments created as space societies. The space crew model becomes impractical quickly as we travel farther away from Earth (Gangale, 2004). With this in mind, we can take advantage of research already conducted on Earth by adapting what we know about culture, social groups and organizations. From there, we can begin to examine how these lessons may be applicable to social life within space societies. From a sociological/social science perspective, this requires moving beyond the space crew model to more complex approaches that better mirror social life as we know it on Earth.

A major impetus accounting for the establishment of sociology related to the need to explain social changes without precedent as societies transitioned from rural communities to urban societies. The European founders of modern sociology found themselves with the task of trying to explain how tremendous turmoil in industrializing societies could occur without tearing them apart in the process. Additionally, they had to explain how the new social systems could sustain their populations without reliance on the old social and cultural patterns.

Functionalist Emile Durkheim (1858-1917), a founder of modern sociology, developed the concepts of *mechanical solidarity* and *organic solidarity* as two forms of social integration. To greatly summarize, Durkheim (1964) viewed pre-industrial society as based primarily on mechanical solidarity in which individuals shared a sense of social reality based on their common lifestyle. Among other characteristics, there was a low division of labor, pervasive collective conscience, low individuality, a relatively low level of interdependence among members. In contrast, organic solidarity exhibits near opposite traits in which the emphasis moves to a high interdependence based on the high division of labor that develops. People depend upon one another for their survival because they become highly individualistic and incapable of meeting all their social needs for themselves. Tönnies (1963) made famous a similar distinction with his terms *Gemeinschaft* (roughly defined as “community,” and characterized by mechanical solidarity) and *Gesellschaft* (roughly defined as “society,” and characterized by organic solidarity).

How is this applicable to a space colony? Consider the following questions. Should we strive for creation of a space community that corresponds to a colony’s smaller total size due to the benefits of primary relationships? Conversely, are there benefits to a *Gesellschaft* society model that offer even greater advantages? The number of inhabitants must equal that which allows for the survival of the colony. That is, the number of inhabitants must satisfy the colony’s needs for the appropriate occupational statuses required to serve the population’s life functions. The obvious needs such as food, water and shelter come easily to mind. However, even the availability of what may be considered trivial needs by some must exist such as the availability of a good barber or dentist, as well as a good medical doctor. Far from Earth, we cannot base the number of inhabitants on any scheme that attempts to replicate a community based primarily on mechanical solidarity. While larger groups do become more complex quickly as new members are added, we know that even isolated societies break down into subcultures which consist of secondary *and* primary social bonds. Moreover, the adaptability of a *Gesellschaft* society is greater.

Thus, the more important consideration is to meet the social needs of all inhabitants and to ensure a fairly high level of social integration among its inhabitants as well. Too few members would result in even more dire problems than a lack of intimacy with all members. It is probably best to socially construct a *Gesellschaft* society from the beginning and seek to construct viable communities within its overall structure. Rural areas can be built and maintained, but the overall society must be based on organic solidarity. On Earth, farms and dairies provide products for consumption as part of an overall social structure reflecting organic solidarity. As a rule, then, we should be thinking in terms of thousands of settlers, not merely hundreds, as soon as it becomes feasible.

The complexity and diversity of social life on Earth requires reproduction in space societies, especially as they must become more and more self-reliant. Doing so represents a difficult undertaking. For one thing, we must begin to think in terms of diverse occupational statuses. To function properly, all societies require scientists of various specialties, politicians, attorneys, farmers, physical laborers of various sorts, shopkeepers, and so on. One central characteristic of *current* missions in space involves the great amount of time crews spend in the occupational statuses. This makes sense for short duration missions in which it is possible to maintain a “workaholic” lifestyle. Even a six-month stay at the International Space Station does not even closely approximate the conditions in an isolated space society in which a near-term return to Earth seems unrealistic. One’s occupational status is undeniably important, but it still only represents only one of many in one’s status set (i.e., collection of social positions that characterize a particular social human being). Other statuses such as spouse, parent, recreational athlete, and friend require fulfillment as well. “Spacefarers, like everyone else, need balance in life” (Harrison, 2001:204). In fact, all societies require *status* diversity in order to meet all of the social needs of their citizens. By definition, then, any *Gesellschaft* space society will require a population composed of a mixture of occupational statuses and their related skills reflected in the role sets of individuals.

In summary, a major subject to contemplate involves the level of social organization for the *initial social conditions* of the colony. Based on the foregoing argument, we should build toward an ultimate goal of constructing a *Gesellschaft* space society characterized by numerable rich and viable space communities within it. Only with this organic reliance of colonists upon one another can space colonies thrive and sustain their populations in an isolated social setting.

Considerations of Culture and Social Structure

Consequently, then, one area of planning uniquely requires the input of sociologists and other social scientists. We must think in terms of constructing initial social conditions for the colony as deemed preferable based on specific criteria determined as part of the very beginning of the planning process. This process includes establishment of a dominant culture as well. Sociologist Robert Bierstedt (1970) identified three dimensions of culture as consisting of ideas (including values), norms, and material culture. Initial conditions must include formulation of these elements. Values, norms, and role expectations supportive of the space settlement will be extremely important upon reaching the destination. Initial ideas and priorities for the initial cultural environment will largely shape the colony early on, and we should also consider community needs and subcultural priorities before well before the launch.

Our sense of social reality, or worldview, is learned from our culture. Social structure provides us with recurring social patterns that make a stable society possible. Without social structure, our social reality tomorrow would be substantially different than the social reality today. These social patterns allow for a sustainable social reality for a long-term basis, and they are guided by cultural values and protected by social norms.

Social conditions and social change affect cultural and social development, and even the psychological health of the members of society. Colonists must be educated to expect social problems to emerge and cope with them as they do so. Furthermore, negative social conditions may force individuals and social groups to adapt in ways considered “criminal” or otherwise deviant according to the standards of the larger culture while others simply take advantage of the social disorganization by employing approved, though harmful, means. Social institutions may break down under severely challenging social conditions. We have all seen the possibilities of negative social conditions in space in the numerous depictions from science fiction. Such scenarios actually represent literary adaptations of conditions familiar to the inhabitants of Earth. A system of formal or informal social control must therefore exist to protective the normative climate of the colony.

Proper anticipation of social needs ahead of time allows for incorporation of social and cultural patterns into the fabric of these communities from the beginning. Any new society must be built upon a solid foundation. Its organization and functioning must be guided by ideas and a sense of purpose (provided by culture). Colonists must learn the values and norms of their new society *before* they depart. A new colony in space, or anywhere else, cannot sustain itself as intended without detailed planning of its overall social structure and the social institutions that are part of that structure.

A final consideration covered here regards the development of the culture. Based on experiences on Earth, it is probable that the space society will become more and more ethnocentric over time. Its members will come to view their own society as superior to others on Earth and elsewhere. This should be anticipated and plans must be made for the development of “interplanetary relations” (Pass, 2004b, 2004c). Research from scholars now focusing on international relations, political science, and political sociology can provide valuable insights.

Social Institutions

Social institutions exist to meet the basic needs of the people of a particular society. They are essentially social structures consisting of statuses and roles created to serve as a standardized approach to solving a specific set of problems. Institutions are specialized social structures, then, and capable of adapting to changing conditions through a process known as institutional differentiation. Newly-created institutions may arise to focus on an emerging set of unique problems or to cope with significantly changing existing problems.

Construction of a new social environment brings with it complexities that can easily rival construction of the physical environment within which it resides. A quick inventory of modern social life brings one to this conclusion rather quickly. Thus, the complexity of a large space colony negates the approach of organizing social life around nuclear family structures. The impracticality of a macro-level community structure was ruled out previously in an earlier section of this paper.

The practical approach involves constructing specialized institutions to cope with inevitable social changes that arise often in the form of challenges. Colonists can expect the inevitability of social change. They can react to changing conditions haphazardly due to their unpredictability or attempt to implement institutions capable of preventing unmanageable problems and coping with controllable problems in an organized way. The latter is preferable, obviously, but it involves the construction of carefully planned social institutions. Beyond its initial construction, the social forces inherent in a space society produce changes that require adaptations that social institutions must successfully accomplish.

Although they are unavoidable characteristics, isolation and large population size create challenges that require the creation of social institutions to carry out the life functions that humans living there were socialized to expect, understand, and rely upon in their social environments on Earth. A brief overview of the vital institutions and some of the related issues illustrates the complexities of the task ahead.

! Politics – colony constitution and government structure require careful construction; a moral and just government must protect the freedoms of its citizens, and these freedoms must be clearly and thoughtfully defined; and at some point, sovereignty will likely become an issue.

! Family – as common in terrestrial migrations, family life is an essential element of community life; it serves as the central institution characterized by primary bonds; this element further discounts the viability of the professional crew model.

! Economy – like any society, a workable economic system will prove essential; can we construct an economic system that improves on problems of social class and socioeconomic stratification as found on Earth?

! Religion – freedom of religion must be protected; the heterogeneity of the population will surely include religious diversity; religious conflict can be extremely destructive to any society as exemplified throughout the history of terrestrial societies and so its mitigation is vital.

! Criminal justice system – law and law enforcement represent vital elements of the space society because a heterogeneous population inevitably produces diverse ideas, practices, and preferences in the multitude of areas that comprise social life, thus, some level of deviance is expected as normative.

! Military – a consideration of the level of military presence is unavoidable; should the military run the colony, should it be excluded altogether, or should there be a compromise?

! Recreation – many of the long-term social and psychological implications of a life on an enclosed colony far from Earth remain unknown; however, activities that redirect attention to other concerns must be central elements of the social lives of the colonists.

Careful consideration of these types of issues can go a long way toward avoiding the social disorganization and resulting undue conflict characteristic of frontier life on Earth. Thus, the social reproduction of institutions represents a vital exercise. Planners must carefully evaluate and implement social structures that can meet the needs of the colonists and the entire colony.

SUMMARY AND CONCLUSIONS

The major two themes underlying the contents of this preliminary essay are as follows: (1) the social environment, though largely ignored by space scientists and engineers (and even by the sociological discipline), is just as vital to the overall success of a space colony as the physical environment and (2) the importance of the social environment necessitates scientists in the physical and social sciences to strongly collaborate in order to ensure overall success of any space settlement without regard to its population size. To emphasize the first theme even more strongly, meeting the social needs of the settlement and settlers is just as important as meeting their physical needs such as breathing or eating.

Regarding the second theme, astrosociology should be adopted by both sociology (and the other social sciences) and the physical sciences (especially by scientists working within the space community). Astrosociology, due to its very focus, is the perfect field to allow for the forging of this multidisciplinary approach. It should be accepted as a fundamental area of study within space and engineering conferences, NASA and all national agencies, and by the sociological discipline and all those within the social sciences, behavioral sciences, and humanities. This bold call for the acceptance of astrosociology is necessary due to the fact that, even now, we begin plans for a Moon base *without* adequate attention to the social environment. The foregoing discussion and recommendations below demonstrate the seriousness of this shortsighted approach.

The social construction of a society in space involves the purposeful creation of initial social conditions that planners deem to be appropriate and desirable based on Earth history and the philosophies, teachings, and lessons learned on this planet. In a sense, when we aim to create a new society in space that is isolated from direct influences of Earth, we are attempting to formulate a social system based on some type of utopian model. The newly emerging subfield within sociology known as futures studies seeks to apply the sociological perspective to the scientific study of possible alternative futures. (See Bell (2003a) and Bell, (2003b) for an excellent treatise on this new subfield). Utopian models are clearly one type of alternative future, and one which we strive for under the best of circumstances. The social construction of a space society provides us with the perfect opportunity to set initial conditions to utopian standards as defined by the planners of the mission. We should get started right now, and seek the assistance of futurists from sociology and the other social sciences.

A warning bell must be sounded, however: *We should hope and plan for utopia, but remain prepared to deal with dystopian conditions.* With proper consideration, the initial utopian conditions are unlikely to devolve into chaos or anarchy, though we can expect value conflict, social groups with different agendas, as well as deviance at all levels of social reality (i.e., micro, middle, and macro levels). To minimize social conflict and cope with it, we must take certain precautions. As discussed earlier, we must put into place the social institutions necessary to provide the life functions for the colony as well as to cope with social change and social disorganization.

The preliminary list of recommendations below deserve great deliberation and collaboration among scientists from all of the sciences in order to achieve the greatest likelihood of success for project related to space settlements, simple and complex, and all along this continuum.

! Relationship between social and physical environments – while this paper focused upon the social environment, there is an extremely important relationship between the social and physical environments; we should never forget this as it is the cornerstone requiring the collaboration between social scientists and space scientists/engineers within the context of astrosociology; engineers and social scientists should work together to build an internal environment conducive to normal social life; the work of urban sociologists will prove valuable.

! Selection of colonists – the process to select colonists represents a vital step in the success of the project; the selection process probably should not result in a population of elites (though a certain critical number of scientists, engineers, and specialists of various types remains necessary); population should be heterogeneous, and with that, we must prepare for the conflict that occurs within a population characterized by diversity in its many forms (e.g., based on social class, race, ethnicity, sex, power, prestige, age, religious affiliation); we should not strive for homogeneity in order to avoid possible discrimination but should attempt to curtail it as much as possible.

! Analogs – we should take advantage of analogs on Earth and later elsewhere in the solar system so as to avoid common historical mistakes; examples include life aboard submarines, aircraft carriers, space stations, and arctic expeditions; this is not a new idea (Finney, 1985), though all of the lessons learned from these valuable sources of data should be incorporated into the formal preparations of new projects; the emphasis here is on the social environment within the physical structure.

! Trial runs – although not a new idea, the approach in which terrestrial mock-ups of isolated societies that approximate intended initial social conditions serves as a great laboratory without the same level of risk (see Finney (1985), for

example); perhaps a permanent “assimilation center,” designed to acclimatize potential colonists to the culture and social environment of their new colony, can serve the needs of a long line of project populations over a long succession of colony projects.

! Reproduce social system en route – for longer voyages, the social conditions anticipated for the space society can be reproduced aboard the spacecraft to a significant degree; the population can further acclimate themselves to the culture, including the values and norms of the new colony, so that culture shock does not await them when they disembark at their final destination; the social problems that arise from the initial social conditions can be worked out during the long voyage.

Finally, these areas of planning for a colony project and implementing its earliest components necessitate the space community’s collaboration with the social sciences under the banner of astrosociology as the recognized field in an academic environment that otherwise lacks this possibility or even an interest in doing so. Human factors must be expanded to include well-established traditional sociological and social science principles and research findings. Let us begin this overdue work as it becomes ever more important with the passage of time!

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