

The Sociology of SETI: An Astrosociological Perspective¹

by

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Abstract

Throughout the space age, the social sciences, and especially sociology, demonstrated a strong reluctance to address human behavior and societal issues related to space. The American larger culture supports space exploration though an undercurrent exists that questions its legitimacy. SETI represents a good example of a substantive area supported in science fiction literature, now adopted by astrobiology, and yet ignored by the sociological community. This presentation seeks to examine some of these contradictions as they relate to SETI and the proposed establishment of astrosociology.

Introduction

A Uniquely Supportive Audience. As an introduction, I am a sociologist in the early stages of a self-imposed challenge aimed at establishing and developing a new subdiscipline called *astrosociology*. In fact, my campaign only recently began in July of 2003. At two sociology conferences in 2004, I had the opportunity to present a grand total of three papers focusing on astrosociology.² These opportunities demonstrate that progress is occurring by the mere fact that the sociological “establishment” approved them for inclusion in their programs. While the results were somewhat underwhelming in terms of attendance, I suspect this reflects

the unfortunate historical inertia associated with the avoidance of space issues and sociologists attending sessions featuring their traditional subfields.

Changing the direction of an entire discipline so that it accepts astrosociology appears to represent a long, drawn-out process characterized by setbacks. For example, my proposal for a special astrosociology session at the upcoming 2006 American Sociological Association (ASA) meeting was rejected earlier this month. While members of the program committee felt the topic had merit, they reasoned that *the relative novelty of the field might be somewhat of less general interest than the other topics submitted*. How can a new topic with merit receive attention if it will not be considered because it may hold too little general interest? What is the point of “special” sessions if the ASA covers only mainstream (currently popular) topics? Perhaps the proposed title of the special session had something to do with its rejection. I called it “Bringing Sociology into the Space Age.” On the other hand, the process has begun. Astrosociology was presented to the sociological community formally in 2004 despite significant levels of indifference and resistance, and the mission of *Astrosociology.com* is slowly gaining greater support.³

In contrast, the delivery of this paper signifies a great opportunity: the introduction of **astrosociology** to an interdisciplinary (yet non-sociological) audience in the context of a topic very well known to its members (i.e., SETI – the search for extraterrestrial intelligence). It represents a refreshing change of pace since I can avoid confrontations with sociologists about the folly of sociology’s failure to address what I call *astrosocial phenomena* (i.e., social and cultural patterns related to space). Many of the sociologists I come across fail to take me seriously when I talk about space (Pass 2004c). I am sure this sounds familiar to SETI researchers. If I happen to mention “outer space” to distinguish it from “social space,” it seems that

UFOs and alien abductions (along with various pseudosciences) instantly come to their minds. Here, at NASA's Ames Research Center, I expect that such is not the case! I hope to demonstrate that contributions from the sociological perspective can add valuable insights to SETI research as well as all other forms of astrosocial phenomena. The unique composition of this audience, unusual in my early experiences related to establishing astrosociology, present me with a great opportunity to express the value of a multidisciplinary approach characterized by the addition of an astrosociological perspective to existing efforts.

Of course, it remains the decision of those from the other disciplines studying the various dimensions of space to help decide where this new sociological subfield fits in with existing approaches. I can only make the argument that it belongs here somewhere because it will provide new and unique contributions for the benefit of all. Finally, a possible irony to consider for those of you comprising this diverse audience: non-sociologists may adopt astrosociology, or at least its contributions, before the sociological discipline. After all, you already acknowledge the importance of space while most of those in the sociological community do not. While this would be a bit strange from my own position, I would welcome it as significant progress nevertheless!

A Tale of Three Communities. When attempting to establish astrosociology, and thus focusing on SETI and other forms of astrosocial phenomena, it is clear that three different communities merit attention based on their distinctive relationships to space. The first is **sociology**, which stands alone among the social sciences in relation to astrosocial phenomena. The average sociologist does not even acknowledge the legitimacy or relevance of astrosociol-

ogy, or its proposed coverage of a specific subset of social phenomena. He or she fails to view SETI as a serious aspect of social life, and thus rejects studying any of its characteristics. (Check out a couple of blogs under “astrosociology” and you will easily find examples of resistance – any major search engine will do). From my perspective as a sociologist, this is a problem!

The second category consists of the **remainder of the social science community (and the humanities)**, represented by those within these various disciplines who study space issues. Admittedly, this is an artificial distinction, but it remains a vital one in the context of the current discussion. Sociology requires separation from the other social sciences due to its historically total disregard of astrosocial phenomena. I assume that indifference regarding space exists in each of the other social sciences, though not nearly to the same extent. Third is the **space community** that, of course, owes its very existence to space. These latter two other communities interact with one another much more readily and approach astrosocial phenomena such as SETI much more seriously. My effort to establish astrosociology goes beyond the creation of a new subfield isolated within my discipline. I would like all three communities to cooperate meaningfully in relation to the study of astrosocial phenomena, including their practical applications for society. The establishment and development of astrosociology will aid this effort, I believe.

Based on the uniqueness of this opportunity (in my experience), I must point out the need to bring together the space community and the sociological community, hopefully facilitated appreciably by scientists from the other social sciences who already study various elements of space. (The need to bring together the social sciences is more obvious). This represents a difficult task due to NASA’s disdain for sociology and sociology’s disdain for astrosocial phenomena (and potentially astrosociology). Historically, sociology lacks legitimacy from

NASA's perspective (Dudley-Rowley 2004) while astrosocial phenomena, and space issues generally, lack legitimacy from sociology's perspective (Pass 2004c). These conditions support a difficult beginning for astrosociology. I am sure that other social scientists have wondered for a long time why sociology has forsaken the study of space and society. Its long-term absence seems incredible to me as well.

Despite the difficulties involved, bringing together all three communities represents an overarching theme of this paper. In fact, elimination of the need to make the distinction between sociology and the other social sciences regarding their relative willingness to study astrosocial phenomena represents a significant objective. A "tale of two communities" scenario in the form of the social sciences and the space community would require a great deal of progress on the part of the sociological discipline. It would require sociology's acceptance of astrosociology.

The need exists to demonstrate astrosociology's legitimacy to all three communities while convincing each of them to cooperate with the other two in their efforts to fully understand the relationship between space and society. As a unique audience characterized by diversity, I can guess that social scientists outside of my discipline can better relate to astrosociology while those in the space community may view astrosociology with more skepticism (though I sense that this is changing). By focusing on a set of astrosocial phenomena common to both social scientists and space scientists, namely SETI, I hope to convince *everyone* of astrosociology's value. I conducted an informal survey via email involving several CONTACT participants. It confirmed my assumption that sociologists are uncommon here. Therefore, my purpose in this social setting is to present reasonable arguments to non-sociologists regarding why accepting astrosociology –

at least as far as recognition of its value – represents a positive development in helping to bring together these three communities.

The value of astrosociology lies in its contribution as an additional perspective to the study of space. It adds a missing worldview similarly to what took place more generally when sociology joined the existing social sciences approximately two hundred year ago: the study of human behavior in the context of societies and the associated components of those societies (i.e., the dominant culture, subcultures, groups, and institutions). Sociology, or more precisely astrosociology, is important because it contributes to a more complete overall perspective regarding the study of astrosocial phenomena. Space represents perhaps the last bit of social territory forsaken by sociology (Pass 2004c), and elites of my discipline show few signs of addressing it on their own accord. The effort to develop astrosociology seeks to challenge this circumstance in a resolute manner.

How many attending CONTACT seriously believe that SETI is a waste of time and money? Not many, or any, I suspect. Yet the same question asked at a sociological conference is likely to yield mostly affirmative responses. As participants at this conference, you logically support SETI and other astrosocial phenomena. My comments to you as a unique type of audience in my short experience as an astrosociologist allow me address professionals who favor space exploration. Thus, I do not have to argue for the legitimacy of studying astrosocial phenomena. I can focus on how doing so benefits all three communities as they now exist.

I realize that non-sociologists have contributed much already making SETI research an interdisciplinary effort. The larger picture inclusive of space issues remains less well organized, however. As such, I propose that all scientists interested in astrosocial phenomena, regardless of

their professional background, rally around a single banner called *astrosociology* (or at least acknowledge its existence and agree to collaborate with astrosociologists). An alternative scenario would require the parallel development of astrosociology with similar developments in the other social sciences (e.g., astroanthropology).⁴ In the context of astrosociology's development, we can change the current circumstances into a tale of two communities or continue with three:

(1) **two communities (social sciences/humanities and space)** – sociology joins the other social sciences with recognition of astrosociology by both communities; details remain open to discussion and debate through collaboration with the space community strengthens;

(2) **three communities (sociology, social sciences, space)** – sociology remains separate though with greater communication, interaction, and organization with the other two communities; astrosociology is accepted though remains separated as part of sociology to a much greater extent;

(3) **three communities (status quo: sociology, social sciences, space)** – sociology remains separated from other two communities; the interdisciplinary nature of SETI research continues to exclude sociology; astrosociology is ignored by most in the sociological community (these conditions are inevitable without the establishment of astrosociology – or something like it).

These broadly-defined alternative futures are listed in their order of desired outcome from my perspective. As an eternal optimist -- how can I be otherwise? -- I work to establish the first type of social reality. In this preferable scenario, all social sciences will embrace astrosociology as one (of possibly many) convenient means to cooperate in their efforts to study space-related human behavior and thereby construct a consistent and easily recognizable literature. Harrison et al. (2000) commented a few years back on the lack of a well-developed SETI literature. A literature devoted more generally to all astrosocial phenomena is even more nebulous. This

deficiency requires considered attention in order to maximize systematically developing a growing, organized literature devoted specifically to SETI and other astrosocial phenomena.

The Sociology of SETI. It seems appropriate to present this non-sociological audience with a few fundamental sociological definitions. *Culture* may be defined as consisting of nearly everything in a society that humans create or think. It reflects the worldview of members of a given society in abstract and tangible forms, providing a sense of belonging and allowing for shared meaning. Culture consists of three dimensions: (1) ideas (including values – abstract standards that define ideal principles), norms (society’s informal and formal rules or expectations), and (3) material culture (Bierstedt 1963). Material culture consists of what humans produce in a society, such as radio telescopes. Material culture can serve as an important barometer of a society’s space infrastructure vis-à-vis its sophistication, pervasiveness, and other characteristics. Ideas receive greatest attention for the purposes of this discussion. A *subculture* is the culture of a particular social group consisting of norms and values that differ from the dominant culture. It is literally a culture within the dominant culture.

But culture alone cannot define a given society because it also possesses structural elements that define social reality. *Social structure* “refers to the recurring patterns of behavior that people create through their interactions, their exchange of information, and their relationships” (Mark (1998) as referenced by Kornblum (2005:82)). *Social groups* are the building blocks of society which are guided by the larger culture and their specific subcultures. Thus, a *society* consists of both culture and social structure. Applications of sociological concepts to the study of SETI and all types of astrosocial phenomena constitute astrosociology’s greatest

contribution. As a social group, for example, NASA must exist in a society interacting with other groups and institutions with each affecting the others.

So, what then is the sociology of SETI? Essentially, it relates to the application of the sociological perspective to the study of social and cultural patterns associated with the search for extraterrestrial intelligence. An exclusively sociological approach involves a dedicated focus on *social facts* (Durkheim 1938/1966) most directly, as opposed to the types of facts characteristic of other disciplines, and thus a focus on traditional sociological variables such as culture, social structure, social groups, institutions, the sociological imagination, social/cultural patterns, social change, and so forth. The sociology of SETI focuses on the social and cultural implications of conducting SETI research such as how current work affects the various elements of society. It also involves why we pursue it as a society (including characteristics of social groups both favorable and unfavorable toward the effort). Of course, the profound reality of actually detecting extraterrestrial intelligence possesses countless sociological implications, many of which defy anticipation or proper understanding in their early stages.

The definition above represents an objective application of sociology to human behavior associated with SETI. This definition currently finds no favor within the larger sociological community, however. In essence, then, there is no *sociology of SETI* in realistic terms because the sociological discipline tends to ignore all areas of social life related to space (see Pass 2004c). The sociology of SETI is actually most properly viewed as a specific specialty under the rubric of astrosociology, which itself faces indifference and resistance blocking its path to successful development. Without the success of astrosociology, “the sociology of” SETI, or that of any type of astrosocial phenomenon, is unlikely to receive much organized attention by the discipline.

That is, under current circumstances, the sociology of SETI depends upon the successful development of astrosociology. Otherwise, no movement toward this end exists within the sociological discipline.

The Astrosociological Perspective. As stated, astrosociology involves the study of astrosocial phenomena which includes all the social and cultural patterns related to space. It includes the study of SETI and all astrosocial phenomena. The major contribution is, in fact, the concept of astrosocial phenomena that ties together social patterns related to space with the various structures comprising society. The astrosociological perspective is essentially the *sociology of [outer] space* which received advocacy in the past without substantial success (for the few examples, see Bluth, 1983; Bainbridge, 1991; Rudoff, 1996). Clearly, a new effort is needed.

Before continuing, I must acknowledge Dr. Allen Tough (1995; 1998) for coining the term *astrosociology* and thereby contributing greatly to its very existence. Although he did not define it directly, I must thank him for making persuasive arguments consistent with the idea that the very pursuit of SETI involves important social and cultural implications. Over time, deviance became less interesting to me, partly because so many sociologists were involved. As an increasingly disinterested criminologist, Dr. Tough's article had the impact of sparking a longstanding underlying aspiration of mine to combine my status of *space enthusiast* with that of *sociologist* in some way. But before I read his article, I lacked the initiative to pursue it. While deviance had become an overly popular subfield, space promised a wide-open territory of study for sociology. I could not believe my eyes upon reading this passage:

...Or will the social sciences wholeheartedly turn their attention to the psychology, sociology, anthropology, history, and potential futures of extraterrestrial civilizations? In that case, astronomy may unite with the social sciences to form a new field called social astronomy or *astrosociology* [emphasis added] (Tough 1995:6).⁵

Upon reading this passage mentioning *astrosociology*, I immediately purchased the domain of *Astrosociology.com* on Christmas Day in 2002. It struck me like a lightning bolt! It is unfortunate that I did not discover his article several years sooner! It took me nearly eight months to construct the fundamental elements of the subfield as exemplified on the home page of *Astrosociology.com* and later expanded in the first part of the *Inaugural Essay* (Pass 2004a) (not to mention the need to learn elementary HTML programming). Defining the subfield and determining its scope proved to be rather difficult though its relevance became increasingly more obvious as the process continued.

For example, consider the following question. As we approach the fiftieth anniversary of the dawn of the space age, how much do we really know about the relationship between space and society? This includes social interactions within social groups in the astrosocial sector, but in the non-astrosocial sector as well (see Pass 2004a for a detailed discussion of these two sectors). In fact, we know very little. Generally, we tend to examine social patterns related to space within the confines of the space program (and more specifically NASA) and thus in isolation from the context of society as a whole. The relatively unexamined nature of the relationship between space and society requires its placement at the forefront of how we perceive space exploration in the future. Furthermore, social reality will become even more complex as the privatization of space intensifies, so we should change our current approach immediately.

The “astrosociological perspective” refers to the approach that astrosocial phenomena affect societies in important ways, just as non-astrosocial phenomena (i.e., other types of social phenomena) affect patterns related to space. This two-way interactive relationship is a vital aspect of the astrosociological approach. It assumes a dynamic, ever-changing (and often unpredictable) pattern of social change related both to a particular society’s astrosocial phenomena and its other social dimensions. With regard to SETI, astrosociology focuses on the values supportive of, and resistive to, the effort along with its ramifications preceding and potentially following successful detection. The social change brought about by the knowledge that we are not alone in the universe will affect larger culture of all societies on Earth as well as each of their social groups (and subcultures), and institutions. For example, institutions subject to change following detection include education, politics, the economy, religion, the family, and even the military services. While the other social sciences have considered this issue, a mainstream sociological perspective remains nonexistent.

The discipline of sociology fails to study the various aspects of astrosocial phenomena in a particular society, as do all social sciences to some extent (especially when not considering SETI). Arguably, SETI represents a form of astrosocial phenomenon that is more wasteful than others in the minds of critics, so sociologists probably shy away from SETI even more than other elements of space exploration. It would not surprise me to discover that the greatest opponents of SETI and other forms of space exploration are politicians and *sociologists*. At the same time, members of the public support SETI more strongly than those within the sociological community. As such, it is important to recognize the juxtaposition of sociology’s avoidance of SETI in a social environment in which a sizable percentage of the public supports it.

“Sociology” is part of the term “astrosociology” partly because it represents a good description of the substantive area. However, it is also part of the term because I want my discipline to participate. I have spent nearly two years trying to overcome the resistance and indifference in the sociological community; that is, attempting to convince *sociologists* of the legitimacy of studying *social patterns* related to space in the midst of the *space age*. While I endeavor to bring the sociological discipline into the space age, the multidisciplinary nature of astrosociology must be determined simultaneously. Our three communities must work together to get this accomplished. The other two communities have started the process. Sociology must now join the effort on a significant scale. Currently, astrosociology represents its best hope in doing so.

Progress thus far is equivalent to a small initial impact on a historically unreceptive professional subculture. Nevertheless, I have reason for optimism based on interdisciplinary efforts by the other two communities (see, for example, Harrison and Connell (1999)). Uncharacteristically, *three sociologists* and sociology itself were mentioned in a past collaboration focusing on SETI! (See Tough 2000 for the entire document).⁶ CONTACT conferences represent a great example as well. Additionally, the work of space scientists and engineers who belong to the International Astronautics Association (IAA) have initiated a project called “The Impact of Space on Society” and they are holding their first conference on this general topic in Budapest Hungary this month.⁷ These collaborations illustrate the great potential, and hopefully the growing desire, to understand how the space sciences, and space exploration generally, affect particular societies.

SETI from an Astrosociological Perspective

SETI as a Category of Astrosocial Phenomena. This paper focuses on the astrosociology of SETI. This particular type of social phenomenon includes all social and cultural patterns related to the search for signs of extraterrestrial intelligence. When referring to SETI as a single substantive area, it actually refers to this collection of social patterns. SETI serves as a great example due to its unusual characteristics, two of which involve (1) the nongovernmental nature of its operation (we still live in a world in which most projects remain uninfluenced by a serious privatization of space) and (2) the unique cultural values associated with the search for intelligent alien life which favor and disfavor SETI. Moreover, it is a good example because most in the sociological community would view its discussion as a waste of time. In contrast, this conference presents an opportunity not yet common for sociologists interested in space exploration. Despite its absence, the sociological perspective receives greatest attention here to demonstrate its value in contributing to a greater understanding of SETI-related issues. Of course, the insights applicable to the example of SETI are also relevant to all types of astrosocial phenomena.

SETI represents an organized way to contemplate, and perhaps discover, our place in the universe among other things. It has strong roots in human society even as it focuses beyond the Earth. The astrosociological perspective contributes uniquely to the other social sciences and the space sciences in ways that enhance the understanding of various facets of SETI in the context of society. Among other things, astrosociology investigates:

(01) how SETI research is conducted within the space community (a longstanding tradition of organizational analysis);

(02) levels and forms of cultural values and other ideas critical of SETI (including perceptions of the public, religious leaders, and politicians);

(03) levels and forms of cultural values and other ideas favorable to the serious search for extraterrestrial life that lacks any guarantee of success;

(04) other types of astrosocial phenomena as they interact with SETI-related social patterns;

(05) how SETI efforts fit into a particular society, involving interactive effects with various forms of non-astrosocial (or other social) phenomena; including interactions between the astrosocial sector and non-astrosocial sector;

(06) how continuing unsuccessful SETI efforts contribute to cultural and social change in a particular society's institutions and groups;

(07) the ongoing impact of structural/cultural elements of a particular society that contribute to the development of a *spacefaring society* along a continuum from the current level of *space capable society* (theoretically, ongoing astrosocial phenomena (including SETI) contribute in combination with non-astrosocial phenomena to drive social change);

(08) the impact of discoveries by the space sciences, including astrobiology, relating to extraterrestrial life or its possibility; conjecture regarding the social/cultural characteristics of an extraterrestrial civilization prior to successful detection;

(09) how successful detection of ETI would impact on societies collectively and individually; for individual societies, this includes the differing levels of social change affecting the various cultural and structural elements as well as characteristics of cooperation and conflict among them; and:

(10) (potentially) the characteristics of an extraterrestrial civilization following successful contact and the interplanetary relations that may develop.

Much of this sounds familiar because an astrosociological perspective provides a complementary lens to existing efforts of social scientists focusing on space. For the purposes of considering both the importance of SETI research and the importance of establishing astrosociology, the relationship between SETI and society receives attention most strongly in terms of how astroso-

cial phenomena are integrated into a society's culture and social structures. Thus, these ten elements exemplify the important implications for all discussions related to SETI from an astrosociological perspective.

Relationship between Astrobiology and Astrosociology. Similarities between these two subdisciplines involve much more than the similarity in their names. This relationship received attention earlier in a two-part essay (Pass 2004a; Pass 2004b) and represents a serious consideration. As stated, astrosociology partly focuses on what astrobiologists do and how their activities affect society. A large emphasis of astrobiology seeks to discover and understand life beyond the confines of the Earth's biosphere. NASA's Astrobiology Institute defines *astrobiology* as "...the study of the origins, evolution, distribution, and future [fate of] of life in the universe."⁸ While astrosociologists do not conduct astrobiological research, they study how astrobiologists conduct their own research as they interact within the astrobiological community, as well as how these astrosocial activities affect other astrosocial and non-astrosocial components of society. This basic astrosociological approach is the same for all the space sciences. Astrobiological research, by the very nature of its subject matter, exists as part of the astrosocial sector (Pass 2004a). Therefore, the other, arguably central, component to an astrosociological approach focuses on the mutual effects between astrobiology and the various non-astrosocial social structures, and how they contribute to social change.

Furthermore, as soon as we begin to discuss astrobiological issues, including SETI, we inevitably begin to consider social and cultural issues. The search for life of any variety inevitably creates repercussions for societies and their citizens. Space scientists (e.g., astrobiolo-

gists, planetary geologists, even aerospace engineers) discuss astrosociological issues when attempting to explain (or justify) their efforts to the public. We can see it in many of the documentaries focusing on alien life that are aired on television and in the other media. Thus, astrobiological issues possess fundamental, and thus unavoidable, astrosociological implications. The common questions bring this home. First, are we alone in the universe? Where do we fit into the big cosmological picture? Is it important for us to seek answers in an organized way? What happens to our societies if we discover extraterrestrial intelligence? Alternatively, what happens even if we “only” discover microbial life? The two subdisciplines are intertwined. Cultural and social considerations from a sociological perspective are imperative additions to considerations currently discussed by those from the non-sociological communities. Again, it is the development of a multidisciplinary approach that provides greatest potential for achieving our greatest level of understanding.

Examples of Support and Opposition. The rich tradition of science fiction literature demonstrates the significance of astrosocial phenomena, especially in industrial and post-industrial societies. Science fiction serves both as a reflection and projection of culture. Additionally, science fiction partly reflects a culture’s fears but also its cherished values. Considerations of alien life, whether friendly, confrontational, or deadly play a substantial part in shaping our preconceived notions of humans in space. Science fiction serves partly as a futurist exercise. The interplay between science and storytelling fuels our imaginations. Our culture consists of values that support exploration including discovery of how the universe operates. Material culture adapts when science *fiction* becomes science *fact*. Science fiction even

demonstrates the possibility depicted so well in the original *Star Trek* series that a robust space exploration program can contribute meaningfully to the establishment of a more just society. Simultaneously, science fiction warns us of potential calamities that may await us in the future. Future exploration may move us toward a utopian world or a dystopian world, but exploration serves as the common denominator. On balance, science fiction contributes to a significant level of support for SETI and other forms of space exploration. In fact, this connection deserves greater attention to assist us in understanding the connections between space and society.

Yet social conditions are never perfect. There are always contradictions in complex societies. An undercurrent of resistance to space exploration also characterizes human cultures. Critics are not difficult to identify. *After all, most of them seem to be sociologists!* Astrobiological pursuits are often seen as seeking knowledge “for its own sake” rather than contributing something explicitly beneficial to society. Space exploration is largely peripheral to their everyday lives and experiences. (For critical sociologists, if space exploration is insignificant to everyday life, then the study of it makes no sense to them).

For many, then, opposition to SETI is traceable to secular considerations such as the perceived waste of societal resources, and diversion of attention and these resources from objectives evaluated as more important. Solving earthbound **social problems** represents a commonly held alternative use of these funds and scientific resources. Many argue that we should cure AIDS and cancer, solve the energy crisis, defeat terrorism, end poverty and homelessness; and this represents just a short representative inventory. For these critics, space exploration occupies a very low position on the priority list due partly to their failure to recognize its actual benefits. Proponents, in contrast, point to spinoffs and potential solutions to population

growth and the energy crisis. Astrosociology, as a science, does not attempt to prove them wrong directly just as a criminologist does not pursue his or her study of crime as an uncompromising moralist. The astrosociological approach seeks to reach an *understanding* of these attitudes in the context of all the others. It seeks to determine how they fit together in the overall cultural mosaic. Unless one is pursuing an *applied* methodology, objectivity remains the standard for astrosociology or any positivistic perspective.

For others, the opposition involves religious implications, especially as they relate to intelligent life elsewhere in the universe (Vakoch 2000). What are the religious values in the subcultures of societies that affect the very inclination to seek answers to questions such as “Are we alone in the universe”? How do they influence decisions about whether or not to support astrobiological research and other forms of astrosocial activities? Research may generate findings that increasingly favor ETI. Scientific findings that threaten human supremacy receive attention from religious groups. As a result, therefore, some religious organizations may seek to stop, or at least greatly curtail, efforts that potentially disprove humans are the highest form of life in the universe in order to protect their belief systems. In the past, it was not easy for many to accept the notion of the Earth circling the sun. Resistive activities by religious groups may even trigger one or more widespread social movements around the world should alien life come to appear inevitable. If ETI is discovered, would they equate aliens to demons? Would they simply reject the proof? (It is not unprecedented. For example, many firmly believe that humans never set foot on the moon). Astrosociologists would certainly study such social realities as they arise. In contrast, other religious groups may possess values that better allow for the incorporation of extraterrestrial intelligence because it is more consistent with their overall dogma. As

such, they would be neutral or perhaps even encourage astrobiological research. Astrosociologists should intensify research related to all ideas and behaviors demonstrating opposition to SETI.

This undercurrent of criticism possesses limitations, however. Currently, astrobiological research continues to make remarkable progress. Why is astrobiology gaining greater recognition and support in the space science and larger science communities? Why does much of the population support it? In this context, astrosociologists focus on how, why, and to what extent, astrobiological activities and discoveries are important to a particular society. Various subcultures possess their own reasons for favoring or opposing even the chance of discovering alien life in any form. They require exploration. The fact that human beings in organized social groups are actively seeking life beyond the Earth makes astrobiology an important subject of astrosociological research. In fact, the effects of astrobiological activities (including momentous discoveries) should be of keen interest to astrobiologists and astrosociologists alike.

Implications of a Successful Outcome at the Societal Level. These remarks complement implications already discussed focused mostly at the social group level. The possibility of the eventual success of a SETI project provides a very good example of how astrosocial phenomena can affect the non-astrosocial sector! It raises some extremely intriguing questions. What would happen if a SETI project finally did find irrefutable proof of extraterrestrial intelligence? How would non-astrosocial segments of societies around the world evaluate such a discovery? What effects would it have on various specific societies? How would the course of social change be altered by such an event? Consider this: at some distant point in the future,

astrosociology may include the study of a known extraterrestrial society and its quantifiable impact on Earth-based societies!

Undoubtedly, knowledge that human beings from the planet Earth are not the only living beings in the cosmos would transform societies around the world. Conflict among nations represents one type of development if they react differently from one another. Conflicts among groups and institutions within societies along multiple social dimensions would develop as discussed elsewhere. Cooperation is the probable overriding reaction, however. Nations are already cooperating about how to handle such an announcement; but the actual discovery will potentially engender even greater cooperation among the astrosocial sectors and governments of all nations. Evidence for cooperation already exists in space exploration as it is more cost effective for all participatory nations and allows for a greater number of individuals to participate. Current examples, of course, include construction and operation of the ISS and the Cassini/Huygens mission to the Saturnian system. The collective reaction will depend on the assessment of what type of life is discovered and its potential implications. A good SETI-related example of cooperation is the development of the document entitled *Declaration of Principles Concerning Activities Following the Detection of Extra-terrestrial Intelligence (Acta Astronautica 1990)*. Cooperation on an international scale may help to regulate reactions of individuals through the construction of a favorable normative climate. In other words, deviant reactions and panics may be reduced within the populations of nations by an organized reaction among nations at the societal level. We cannot assume that subcultures within societies will react like their national leaders.

Gauging the Importance of SETI and Astrobiology, and Astrosociology. The level of importance of SETI efforts may serve as a proxy for measuring the relative importance of astrosocial phenomena to a society. Potentially, it is a good metric because its success is unknown and thus serves as a low-end reflection of support for space exploration. Public opinion is an important source of influence on society by a non-astrosocial source. An important distinction, relating to the structural elements of a society, involves that between government support and public support. Because there is an increased level of support for SETI efforts by the public, the relative importance of astrosocial objectives and goals has increased compared to past periods in spite of NASA's indifference. As a start, the efficacy of this measure as a barometer of astrosocial pursuits warrants testing. The prediction offered here is that the impact on society of the astrosocial sector has increased to a significant extent, due to the interactions between individuals and groups within the astrosocial and non-astrosocial sectors. These interactions will drive even greater social change in the future as SETI and other astrosocial phenomena become more strongly integrated into cultural and social-structural elements of societies.

Finally, the definition of SETI currently involves astrobiological considerations most strongly. The biological aspects of SETI are rather obvious, of course. However, as this discussion demonstrates, SETI also possesses many important *sociological* ramifications as well. The impact of discovering life of any type beyond the confines of the Earth's biosphere will instantly set into motion cultural and social changes of considerable magnitude. Astrosociology will undoubtedly develop a major focus on this topic, working in conjunction with astrobiological efforts. As with astrobiology, SETI must become an important astrosociological specialty,

becoming the career focus of some of astrosociology's first devoted scientists. Astrosociology is relevant in large part because astrobiology is relevant to society.

Applied (or Practical) Astrosociology. The definition of applied (or practical) astrosociology is consistent with that of applied sociology. The difference relates to its specific focus on astrosocial phenomena. Thus, the definition of *applied astrosociology* is the application of astrosociological knowledge to astrosocial phenomena in a manner consistent with improving them for the betterment of (1) space exploration and potentially (2) other aspects of a particular society. In other words, applied astrosociology involves the use of theory and research to solve real social problems related in some way to astrosocial phenomena. Benefit to society may occur from an astrosociologist's participation in technology transfer for medical or environmental applications. After all, the study of social problems, including their identification and potential solutions, is a longstanding sociological specialty.

Applied astrosociology can provide invaluable contributions as the space operations of NASA and private organizations become more socially complex. Current missions involve dyads and triads for the most part, all of them are temporary situations (although ISS missions are of longer duration), but this will change over time. As more spacefarers live together over longer periods of time, space communities of increasing complexity develop. In practical terms, when two or more people live together in space, it is a social group. Due to their isolation, it is best to think of even a dyad as a *space community* because its members depend upon one another extraordinarily for their survival due to their isolation. The study of social groups and communities from a sociological perspective represents a long and rich tradition. It makes sense to apply

sociological principles and concepts to space communities. An astrosociological perspective can contribute to current efforts. A permanent lunar base constructed to service a telescope designed for conducting SETI and astronomical research represents a logical development. Such a community would require study from the perspective of the performance of its members' duties, but also from the perspective of the social life of its "citizens." While professional success is important to understand, the success of the community built upon an ever growing number of social interactions is even more crucial because it creates the social reality characterizing this isolated social environment, and most of these interactions have little connection to their occupations.

Applied astrosociology in the context of SETI is therefore important. The contributions of astrosociologists to the successful performance of SETI research can benefit any given program in similar ways that other social scientists currently do. Additionally, astrosociologists' developing understanding of the relationships between a particular society and its SETI programs can help improve public support, and even governmental support, as well as contributing to a better social integration of these programs with other social institutions and groups. The astrosociological perspective is purposely oriented toward a constant focus on the interactions between astrosocial phenomena and other social phenomena, and perhaps most importantly, how these interactions contribute to social change. Applied astrosociology seeks to manage this social change to meet identified objectives to the extent possible.

The related contributions potentially possible through the addition of an applied astrosociological approach include:

- (1) making space missions more successful by adding a sociological perspective to planning and research starting at early stages (“expanding” the concept of *human factors* to include well-established sociological concepts and principles);
- (2) taking advantage of sociology’s rich tradition of community research;
- (3) constructing space-based social environments that are more livable from a community perspective;
- (4) understanding the connections between space and society in order to take advantage of how benefit to a given program, social group, and/or the entire society may be maximized (and any negative effects minimized); and:
- (5) allowing for a better coordination of space exploration with other social priorities partly by demonstrating the relevance of astrosocial phenomena, including SETI, to other social concerns.

These examples are but a few of the possibilities. The space community should view applied astrosociology as an added component to current practice. The intention is not necessarily to replace anything currently in force, such as the notion of *human factors*, though it does involve a reorientation of the current approach to an extent in order to focus on *astrosocial phenomena*. Taking greater advantage of sociology and the other social sciences can only benefit the space community. After all, the space community must operate within society and thus would benefit from a better understanding of all the social and cultural implications largely ignored during most of the space age. Generally, a better overall understanding of astrosocial phenomena and practical implementation of this knowledge will result in a greater percentage of successful missions, more pertinent space policy and space law, greater political and public support, and other beneficial outcomes.

Conclusions: The Space Community, the Social Sciences, and Sociology

SETI serves as a good example of how bringing sociology into the practice of studying space exploration can result in a more complete level of understanding and even greater practical benefits. Historical social patterns have contributed to the isolation of sociology and thus its failure to participate in space research in a meaningful way. Various (non-sociological) parties speak about social and cultural variables involving astrosocial phenomena while usually failing to acknowledge the possible contributions from the discipline of sociology. In contrast, the potential of sociology as an untapped resource in light of its absence is expressed well by psychologist Douglas Vakoch (of the SETI Institute):

As a discipline, sociology is well-suited to make significant contributions to the study of space exploration. For example, recently an interdisciplinary group of scientists identified opportunities for sociology and related disciplines to contribute to research related to the Search for Extraterrestrial Intelligence (SETI). In reviewing work done to date, they concluded that "Social scientists have tended to focus on individual reactions, neglecting serious treatment of organizations, societies, and interstate political systems. Even representatives from anthropology and sociology have shown a strong psychological bias, meaning that many subfields of anthropology and sociology have yet to be tapped." Specialists in the subfield that Professor Pass has identified as "astrosociology" could add much to our understanding of a diverse range of issues in the space sciences and their social impact. (Quote taken from Harrison et al. 2000).⁹

Sociology has a long and distinguished history of constructing theory and conducting research in other avenues of social life. Even so, for its own part, sociology has ignored space as a significant substantive area. For this reason, I have termed space as sociology's forsaken frontier (Pass 2004c). Despite significant obstacles and setbacks, progress slowly continues and some of the support already comes from outside of sociology.¹⁰

Astrosociology is new, both to sociology and to the entire scientific world. As such, its future character remains largely undetermined. We find ourselves at the point in history that will determine its foundational character. From my perspective, the three communities exhibit a lack of cooperation that requires addressing due to its effect of marginalizing astrosociology just as it attempts to establish itself. In fact, this uncooperative climate harms all three communities and space exploration itself.

Historically, NASA has avoided input from the sociological community (Dudley-Rowley 2004). However, NASA and other elements of the space community should seek cooperative interaction with sociology via the emerging subfield of astrosociology in spite of the past relationship to better understand how their objectives and actions affect society and how various elements of society affect them. I believe that NASA should formalize its study of the important relationship between space and society as part of its organizational structure. Astrosociologists strongly favor cooperation among all the social sciences and the space community so as to gain the greatest of understanding of all astrosocial phenomena. Such cooperation will require new approaches to thought and action that depart from past compartmentalized practices.

Social scientists and space scientists should cooperate with the growing number of astrosociologists to develop a multidisciplinary perspective beneficial to all. Interdisciplinary conferences such as CONTACT can help make this possible. While astrosociology is a scientific subdiscipline and thus not a cheerleading “society” for space exploration, it is clear that human societies will likely expand their presence in space. As we move along the continuum from our current position as a *space capable society* toward a *spacefaring society* (Pass 2004b), it becomes ever more important to understand astrosocial phenomena from a shared perspective. The social

sciences must be in place to develop understanding about the changing characteristics and effects of astrosocial phenomena, including SETI. My goal is to bring in the sociological perspective, to unleash the *sociological imagination* (Mills 1959), along side the other social sciences.

Sociology, long absent, possesses potential as an additional significant lens of understanding that complements the lenses of the other disciplines.

I look forward to the day when we can speak of a *tale of two communities* in which sociology joins the other social sciences in the coordinated study of astrosocial phenomena! As Harrison (1997:323-324) pointed out long ago in the conclusion of his book about SETI, the *thinking types* (from the space sciences) and *feeling types* (from the social sciences and humanities) need one another to maximize the likelihood of a successful outcome. Consistent with this reasoning, the social science and space communities must devise new ways to coordinate their efforts. As part of this new reality, I would like to someday see *astrosociology* added to discussions at all conferences dealing with astronomy and space exploration so we may bring in the social sciences, including sociology, to the position they deserve.

I realize that many social scientists outside of sociology have participated with the space community for a while now. However, my hope is that we can rally around one easily recognizable term, *astrosociology* (when referring to the relationship between space and society), so we may better coordinate our efforts to build social theories of consequence and develop a single organized literature. Perhaps this will attract more scientists from all the social sciences. If this level of integration proves impossible, I advocate astrosociologists coordinating their efforts to the extent possible with others engaged in the study of astrosocial phenomena. Much good work with sociological implications has taken place within the other social sciences. It would be

unwise to ignore valuable research, theory, and insights from psychology, anthropology, history, and political science, for example. We must all work together in a new better-coordinated manner yet to be devised though clearly required.

The opinions of all those from the social science and space communities constitute an important element of building the new subdiscipline of astrosociology. I face the challenge of convincing these two communities to accept astrosociology; and ironically, that of convincing my own discipline even to acknowledge it as a legitimate substantive area. Your assistance can provide a significant air of legitimacy to these efforts. I look forward to your views about this vision and potentially our mutual development of the untapped possibilities that await us all as a diverse collection of scientists united due to our common focus on the study of the relationship between space and society.

Notes

01. This paper, presented at the *CONTACT 2005* conference in Mountain View, CA, took place at NASA's Ames Research Center, March 18-20, 2005.

02. The paper (Pass 2004a) discussed at the American Sociological Association (ASA) meeting occurred in San Francisco, CA in August 2004. The California Sociological Conference (CSA) conference took place in October 2004 and placed the first-ever session dedicated to astrosociology into their program. Entitled "Astrosociology: Establishment of a New Subfield," it included the following papers: Pass (2004b), Dudley-Rowley (2004), and Gangle (2004). A second paper (Pass 2004c) was delivered in another session called "Lost Horizons, Regaining Ground" organized by Dr. Marilyn Dudley-Rowley. See the full references below.

03. Members and supporters of *Astrosociology.com* and its mission to develop astrosociology as a new subdiscipline of sociology include sociologists (including budding Ph.D.s), social scientists, and space scientists. See the *Directory* page at *Astrosociology.com* for a listing of those twenty-four brave souls willing to formally announce their support on the World Wide Web (<http://www.astrosociology.com/directory.html>).

04. Recently, Jim Funaro related to me in an email message that he seriously contemplated establishing astroanthropology way back in 1983! An idea far ahead of its time...
05. This page number corresponds to the PDF version of this web article found on the *Virtual Library* page at *Astrosociology.com*.
06. Sociologists David Swift (1990), William Sims Bainbridge (1983), and Don E. Tarter (1992) were referenced in Harrison et al. (2000). See references below.
07. See the website for the First IAA International Conference on the *Impact of Space on Society: Economic, Educational, Political and Cultural Aspects*. (<http://www.impactofspace.hu/>).
08. See the *NASA Astrobiology Roadmap* website for more information, including the seven goals of astrobiology. (<http://astrobiology.arc.nasa.gov/roadmap/>).
09. This passage exists on the *Inaugural Essay Feedback* page at *Astrosociology.com* (the direct URL is <http://www.astrosociology.com/iessayf.html>). Dr. Vakoch wrote it as a reaction to Part One of the *Inaugural Essay*. (The SETI Institute's website URL: <http://www.SETI.org>).
10. See note # 3.

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