The Numbers (part 1)

By : charles schwenk

This story deals with attempts to decode a message from space and its effects on one man's life.

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by Charles Schwenk

1. AN INDECIPHERABLE MESSAGE FROM THE VOID

If a lion could talk, we could not understand him.

(Ludwig Wittgenstein, Philosophical Investigations)

Some people think there is a government conspiracy to cover up the fact that we have received transmissions from aliens. I can assure you that this is not the case. Information on these transmissions is freely available on several websites. There are also numerous scholarly books and several academic journals devoted to the efforts to decode these attempts by aliens to communicate with humanity. Few people know about the numbers from space and, letâ s face it, nobody really cares.

When the numbers were first discovered, astronomers could talk of nothing else for months. However, the discovery had to compete for the publicâ s attention with other more vivid and satisfying stories dealing with international conflicts, economic problems, and the lives of celebrities. Since then, the story of the numbers has grown more ambiguous and, therefore, less newsworthy. I used to think that evidence of transmissions from space would shake our culture to its foundations. In fact, it made no difference at all. I underestimated peoplesâ ability to ignore what they cannot understand.

Most people barely remember the discovery of the transmissions as part of the string of amazing astronomical discoveries of the last decades of the 20th Century, including black holes, evidence of liquid water on the surface of Mars, ice on the moon, and the observation of planets orbiting other stars.

Immediately after the discovery, there was a comical attempt to conceal the information from the general public and restrict it to â responsible scholars.â However, the authorities, as usual, had underestimated the cunning of those committed to free information and soon the text of the numbers could be found on computer screens all over the world. Peopleâ s reactions were immediate, passionate, and intensely polarized. At one end of the continuum, popular books like Beacons of the Gods (Davis, 1992) celebrated the New Age that our saviors from Beta Centauri would bring us. At the other end, books like Why Wonâ t They Leave Us Alone? (Everett, 1991) represented the reactionary perspective that we should ignore the interference of intergalactic busybodies.

A documentary based on the book, Why Wonâ t They Leave Us Alone? went even further than the book by claiming that the Numbers were only the most recent attempt by aliens to corrupt humanity under the guise of â communicatingâ with us and â sharing our cultural heritages.â In a tone sometimes bordering on hysteria, the narrator, Dr. Lief Ran Van der Patten, cited dozens of examples of alien attempts to influence our culture and pollute â the purity of our precious human vitality.â Most people were amused by these ravings, then bored by them. They eventually turned their attention to other things.

When you ask people today, many will say they vaguely remember hearing about the Numbers but usually know nothing at all about them. One reason for this is that the popularizers of astronomical discoveries like the late Carl Sagan did not know what to make of the numbers and so did not discuss them.

Carl Saganâ s response is instructive here. In the 1990's, several years after the numbers had been discovered, he published a science fiction novel entitled Contact (1995), in which he described the â firstâ transmission received from â intelligent life in another part of the universe.â This book was, in fact, a reaction to the discovery of the Numbers and an explanation of why Sagan could not accept the idea that they were really the first transmissions from space.

Sagan believed very deeply that any â legitimateâ transmission from aliens would be decodable. He believed that intelligent life throughout the universe would have to be similar enough that any messages sent, messages that were intended to be easily understandable by other races, would be possible to translate. Therefore, the fact that the Numbers could not be translated was a challenge to his basic assumptions. In dismissing the Numbers, he concluded, â We can be fairly sure that the billions and billions of intelligent races in the universe are trying to contact others and are sending INTELLIGIBLE messages. One day, we will discover one of these if funding is available for research. The Numbers represent an anomalous set of radio signals and no further funds should be spent attempting to decode them. Instead, funding should be directed at legitimate research designed to discover legitimate messages from other life forms.â

There are, however, academics all over the world who have devoted their professional lives to the study of the Numbers. These individuals are supported by the funds Sagan said should never be devoted to deciphering the Numbers. They have built academic careers on the Numbers and they have invested their professional identities in the effort to decode them. As the Egyptian hieroglyphs eventually yielded to the patient efforts of linguists, so the Numbers will eventually yield to the efforts of exocryptographers like Lionel Smith.

2. THE INSTITUTE FOR EXOCRYPTOGRAPHY

Professor Smith taught at the University of Winnemac. Sinclair Lewis described both the state and the university as it was in 1925.

The state of Winnemac is bounded by Michigan, Ohio, Illinois, and Indiana, and like them it is half Eastern, half Midwestern. There is a feeling of New England in its brick and sycamore villages, its stable industries, and a tradition which goes back to the Revolutionary War. Zenith, the largest city in a state, was founded in 1792. But Winnemac is Midwestern in its fields of corn and wheat, its red barns and silos.

The University of Winnemac is at Mohalis, fifteen miles from Zenith. There are twelve thousand students; beside this prodigy Oxford is a tiny theological school and Harvard a select college for young gentlemen. The University has a baseball field under glass; its buildings are measured by the mile; it hires hundreds of young Doctors of Philosophy to give rapid instruction in Sanskrit, navigation, accountancy, spectacle-fitting, sanitary engineering, Provencal poetry, tariff schedules, rutabaga-growing, motor-car designing, the history of Voronezh, the style of Matthew Arnold, the diagnosis of myhypertrophia kymoparalytica, and department-store advertising. Its president is the best money-raiser and the best after-dinner speaker in the United States; and Winnemac was the first school in the world to offer its courses by radio.

It was not a snobbish rich manâ s college, devoted to leisurely nonsense. It is the property of the people of the state, and what they want--or what they are told they want--is a mill to turn out men and women who will lead moral lives, play bridge, drive good cars, be enterprising in business, and occasionally mention books, though they are not expected to have time to read them. It is a Ford Motor Factory, and if its products rattle a little, they are beautifully standardized, with perfectly interchangeable parts (Lewis, S. Arrowsmith, 1926/1980, New York: Signet, p. 10)

In the 85 years since Lewis described it, the University of Winnemac has changed considerably. It was nearly unaffected by the student activism that periodically closed campuses on both coasts in the 1960's. However, since the late 1970's, the state legislature has reduced its financial commitment to the university and as a

result, the cost to students has increased. It is now more important than ever to raise money from other sources. One way to do this is to create institutes that can receive donations from private and government sources. This is how the Institute for Exocryptography was born.

As with all interdisciplinary institutes, this one was full of deeply-committed people who sincerely believed that the way to decode the Numbers was to bring together people from different disciplines and encourage communication between them. To this end, there were frequent seminars, work groups, internet chat groups, memos, e-mails, and informal discussions in which astronomers, psychologists, anthropologists, engineers, physicians, philosophers, musicologists, and organization theorists attempted to communicate their world views to each other. Facilitators, consultants, and mediators of various kinds facilitated, consulted, and mediated these communications. The result was an explosion of intellectual activity. Fragments hit scholarly journals for several years. However, the Numbers remained a mystery, as impervious to this intellectual explosion as were H. G. Wellsâ alien machines to the nuclear weapons we puny humans used against them. What went wrong?

Scholarly disciplines create mind-sets that act like lenses. A physicist sees the numbers differently than a social scientist, and when he tries to decode them, he begins with different assumptions about the message. Communicating these assumptions is difficult because they are so pervasive people are not even conscious of them. Further, when people have conflicting assumptions, communication is difficult even if they have the best will in the world. This point is supported by Schwenkâ s discussion of polarized conflict (see Schwenk, 2002, Ch. 3).

As a result of these processes, the Institute for Exocryptography was, in fact, divided into factions roughly divided along disciplinary lines, a fact that was vehemently denied when a potential new hire was being interviewed.

This was the environment into which Professor Smith stepped as he opened his office door.

"Eight thirty-five exactly," he thought as he glanced at the wall clock and methodically flicked through his ring of keys to locate the one that fit his office door. Finding it, he raised his eyes to the door and paused at the nameplate for a long, satisfying moment. It read:

Lionel Smith: Associate Professor of Exocryptography

Opening the door and turning on the light, he surveyed the office: bookcases reaching to the ceiling, choked with journals, papers, computer printouts and books, a desk and two tables piled high with journals, papers, computer printouts, and empty paper coffee cups. He deposited his stuffed briefcase near the desk and went to the elevator to get his morning's mail. The faculty mailboxes were located three levels above his small, windowless first-floor office. Offices on each floor of the Center for Exocryptography building were arranged in concentric circles and he had to walk down a long, dimly-lit corridor to reach the central elevators. Arriving before the stainless steel doors, he punched the "up" button and when they parted, he stepped inside.

"Floor please!" Smith winced at the metallic sound of the words from the audio unit as he watched the doors close.

Turning his face toward the wall microphone, he said loudly:

"Four, please.â

The doors opened.

"FOUR!" he shouted at the microphone. The doors closed and the elevator shot up to the fourth floor at sickening speed. Scanning his mail on the way back down, he found the usual jewels; two advertisements for tedious new undergraduate astronomy texts (Brand New 2007 edition, many pictures, simplified text designed to meet the needs of the new generation of marginally literate students), a memo regarding changes in sabbatical policy, a note from the head of the faculty parking committee regarding the next meeting, and so on. But, the bundle also contained this month's issue of Exocryptography Review, with Frank Mallard's last article nestling like a coral snake in the pages.

"His last piece as a sane man", Smith thought as he entered the office and gently closed the door behind him. He settled down at his desk beside his small white hillock of papers representing unfinished work. Despite the fact that he was horribly delinquent in all his responsibilities, he decided to take the time to plod through the last academically respectable article by the former father of his field, a scientist with more visibility than most film stars, his former colleague, Frank Mallard. The title read, â Perspectives on the Numbers: A Brief Summary of Sixteen Years of Research.â

"Mallard wrote this in 2005. I remember reading it on his web page." he thought. "It took two years to get into print. About average for a journal. Long time, though. Long enough for Mallard to lose his mind."

In those two years, Frank Mallard had resigned from the Center, stopped publishing, and had formed the "Voice from the Void Church". This institution was doing exceptionally well financially at the present time due to the free advertising provided by the news media. Everyone wanted to know why he did it. Only Smith really knew.

"Read on Smith. You've got a class at 11:00,â he reminded himself. He scanned the introduction to the article, which read,

â The numbers were first received at the Arecibo radio telescope in Puerto Rico on October 13, 1989 at 10:50 PM Greenwich time. Though they are widely known, they are reproduced here as a basis for the discussion to follow:

1* 2* 3* 4* 5* 6* 7* 8* 9*10*11*12*13***

43*12* 7*38* 3*21* 2* 7*70* 1*15*16* 3***

25*8* 7* 5*18*30* 4*27*11*22*35*0?*13***

9*31*40*10*23* 6*33*69*39*20*26*14*52***

*This symbol indicates a time interval of approximately .7381 seconds between each set of pulses which we have identified as a single number. Three of these intervals elapse between each set or group of 13 numbers. The time interval between each of the pulses in each number is approximately .0568 seconds. When this set of transmissions is complete, 2197 of these intervals elapse before it is repeated. The zero in the twelfth position of the third group actually represents two .7381-second intervals with no transmissions between them. This is assumed to represent zero. These signals are being transmitted at approximately half the power with which the Arecibo system can transmit.

The transmissions consist of a series of pulses at the hydrogen emission line of 1,420 MHZ and emanate from a planet orbiting the star Beta Centauri in the constellation Centaurus, approximately 130 light years from Earth. The transmissions have been monitored

constantly since they were first received and have been detectable, with no interruptions, since that time.â

"I would have phrased it differently," Smith mumbled to himself. Then, he recited the first paragraph of the first paper he had written as a graduate student on the numbers.

"As years are measured on some parts of the Earth, the year was 1859. A series of extremely powerful radio transmissions throbbed from a hypothetical transmitter on a planet orbiting the star Beta Centauri and left an assumed atmosphere at 186,281.7 miles per second. One hundred thirty years later, on October 13, 1989, they were accidentally intercepted at the Arecibo radio telescope on this planet."

He had been awarded a "C" on that paper; the first of his life. "Some interesting insights," the instructor had written. "But the flippant tone of the paper is totally inconsistent with the seriousness of the subject matter.â

But Smith's attitude toward the Numbers was anything but flippant. He had been a 20 year old college junior in 1989 when they were first received. He had heard about it on the news. Everyone did. Everyone, that is, except those few print-addicts like his father, who had not watched television that night.

For months afterward, a few people had all the symptoms of lovesickness. They thought about the Numbers incessantly. They had trouble sleeping. They developed haunted expressions and were subject to extreme mood swings. More than one suicide note mentioned the Numbers.

Smith was smitten harder than most people. He had spent most of his Christmas vacation that year trying to break the code. As the days passed and his vacation slipped away, he

grew more and more frustrated and depressed. Each day the Numbers seemed less like a message and more like gibberish. His family was surprised when he burst into tears at the dinner

table one evening toward the end of vacation. His father had asked him how "his translation" was coming.

From this experience, he developed a dark resolve to possess the secret of the Numbers. After eight years of training in psychology, he had developed a dozen equally valid explanations

for his morbid obsession. The more deeply he penetrated the discipline of psychology, the more sophisticated and meaningless the explanations became. He had always liked puzzles. Other people were a puzzle to him, as was his own behavior. In fact, he had always felt that the attempts to decipher the Numbers were a kind of metaphor for the attempt to understand his own behavior and that of his fellow human beings. The Numbers itched at the back of his brain. After he got his Ph.D. in psychology, the second Ph.D. in exocryptography seemed like the logical step.

Smith returned to Mallard's tediously-written article with a kind of deadness,

â For approximately 25 years, from the mid-1960s until 1989, the use of radio telescopes to scan for transmissions from extra-terrestrial intelligences was a sporadic enterprise at best. "Listening programs" as they were called, consisted of brief periods (of a few weeks' duration at most) at some of the major radio telescopes including the National Radio astronomy Observatory in Socorro, New Mexico, the Solar Physics Observatory in Culgoora, Australia, the Academy of Sciences Observatory in Russia, and of course the Arecibo installation.

â Our team was completing a three-day scan of a number of previously examined stars for the purpose of confirming earlier scans which were thought to have been conducted with less than adequate thoroughness on October 13 of that year. At 10:50 Greenwich Mean time, an acquisition signal of 13 pulses followed by an equal period of silence was detected at the emission line for the hydroxyl ion (1,662 MHZ). Following this,

we scanned a number of related frequencies and eventually detected the message at the 1420 MHZ emission line of hydrogen.â

"Mallard's reaction should have alerted people to his instability," Smith quoted from the draft of his most recent paper on Mallard's breakdown. â In describing the moment at a later meeting, Mallard recalled, 'I felt a peculiar and intense pain in the lower abdominal and genital regions brought on by the combined feelings of elation at receiving the transmissions and fear that I might be bitterly disappointed by the future discovery that the transmissions were not of intelligent origin. A small part of the feeling was also due to my fear that the apparent pattern on the printouts was in fact an hallucination signaling the beginning of a psychotic episode.' Immediate consultation with nearby colleagues at the station confirmed the reality of the transmissions at which point Dr. Mallard began trembling uncontrollably, requiring sedation and bed rest for the following two days.

"Hardly a promising sign." it was the psychologist in Smith speaking now. "It's still not clear how the National Enquirer got the story. Somebody leaked it," he thought as he pawed through the burial mound of papers on his desk to retrieve the small paperback, Mallard: Ordeal and Triumph (part of the Pioneers of Exocryptography series). He turned to the third chapter, The National Enquirer Incident and skipped two pages to the interesting part. Within 48 hours of publication of the story, the Arecibo installation was deluged by requests for information. In response, Mallard issued the following statement:

"We are presently receiving a repeating series of radio emissions from a distant star. The narrow band-width and the pattern of these transmissions is inconsistent with the hypothesis that they were produced by any one of a variety of known natural radio sources. However, this data is not inconsistent with the hypothesis that the emissions are the product of an intelligence."

In the following days, the newspapers, television, and radio broadcasts were flooded with rebuttals, rejoinders, comments, and attacks on Professor Mallard's statement. Most dealt with the irresponsibility of the statement and with the suspicion caused by Professor Mallard's failure to disclose the location of the star his team was scanning.

James Holloway, president of the SETI (Search for ExtraTerrestrial Intelligence) society, summed up the feelings of astronomers in this group,

"Professor Mallard's announcement, coming as it does from a highly respected member of our own group, shows a surprising lack of sensitivity to the feelings of our members, the best interests of the SETI society, and the integrity of the enterprise we pursue. Professor Mallard is well aware of the number of false reports of extra terrestrial transmissions from the former Soviet Union, the United States, and elsewhere since listening programs were first begun in the 1960s. Such awareness should have suggested caution to him. No comment should have been made until other radio astronomers had been able to confirm his findings. Further, no statement should have been made without also giving the coordinates of the star which would at least allow us to confirm the transmissions after the announcement.

â It is, in a word, scandalous that we should have to read first in the National Enquirer of an event we have been awaiting for nearly thirty years; an event which has the most profound significance for all of humanity. One cannot help but wonder if some questionable motive was behind this â oversightâ on Dr. Mallard's part. The solemn joy of this moment has been greatly diminished for us by irresponsible behavior.â

Those radio astronomers not connected with the SETI group tended to be more skeptical. The consensus was that Mallard had misinterpreted an emission from a natural extra-terrestrial radio source or from a terrestrial source.

The storm of indignation was not without its effects on Dr. Mallard. Four days after he issued his initial communication to the press, he made a special presentation to an international conference of astronomers in Vienna. Observers at the conference expressed concern at his appearance and a number of his friends suggested that he should seek medical attention.

Smith flipped to the middle of the book which contained a photo history of Mallard's rather dull life. He found the news photograph of the conference. Mallard stood behind a podium with his mouth open and lights glaring behind him. His knuckles were white from gripping the podium and his face was unnaturally pale. He had a red splotch of color on each cheek and his disheveled hair and three-days' growth of beard gave him the appearance of a derelict. But his eyes were like two glowing coals in two tiny dark pits. At that moment, Mallard was electrifying his audience like a preacher at a revival.

"One thing he could do was talk. Infectious enthusiasm. Seemed like every newspaper in the country printed the speech,â Smith thought. â Seemed like nobody talked about anything else. More than just interest. More like a haunting. Everybody wanted to know what the message meant. Nobody was more excited than Mallard. Too bad. Couldn't handle it in the end. Didn't have the belly for it. All that excitement's gone now of course. Seems kind of ridiculous thinking back on it. What did we expect to learn? That message was meant for a wiser life form than us."

Smith reached into the bookcase above his head and retrieved the book which he knew contained the text of the speech, pulling it out gently to avoid an avalanche of printed matter. He couldn't help but smile at the title: Frank Mallard: The First Exocryptographer (Burnside, 1997). "The first exo-loon" he said to himself, thinking that the revised title might increase sales now. This was the book that seduced Smith into the field. One of many bookmarks separated the first two pages of Mallard's damned speech,

â Ladies and gentlemen, I stand before you today with a mixture of emotions so strong and so contradictory that I fear they may effect the quality of my presentation. Feelings of guilt at the way I handled the public announcement trouble me deeply. Also, I am disappointed that I am unable to give you more information about a startling and marvelous discovery we made recently at Arecibo. But loudest in this cacophony of feelings is an intense and profound joy. I now know that human beings are not the only intelligent creatures in the universe. On October 13, at 10:50 PM Greenwich time, we received the first transmissions from a source near the star Beta Centauri, approximately 130 light years distant from us. I am very pleased that I have lived long enough to witness this event.

â I am aware of the justifiable skepticism created by the appearance of the news item in the National Enquirer and my subsequent hasty announcement of our findings. I wanted to wait until I had confirmation of the findings before presenting them to you. Therefore, as some of you know, I have supplied the coordinates of the star to a number of radio observatories including the Solar Physics observatory in Australia, the Effelsberg Radio telescope in Germany, the National Radio Astronomy Observatory in New Mexico, and the Russian Academy of Sciences Observatory. To date, I have received confirmation from three of the four. Only the Academy of Sciences observatory has been unable to confirm.

â The transmissions we have received are clear and unambiguous. From the first time they were received, there has been no doubt at all about the pattern of the numbers or their intelligent origin. The transmissions are not ambiguous. They were not meant to be.

â However, beyond these facts, I have very little to tell you about the beings, our brothers, who sent these messages. Let me at this time run briefly through the list of things we can conclude from the simple fact that we have received the transmissions:

1) Obviously they are at least as technologically advanced as we are (I should say 130 years ago they were as advanced as we are today. Who knows what marvels they have accomplished since then). They were at that time probably more advanced than us since it is more difficult to send such signals than to receive them.

2) They have a thorough knowledge of astronomy. They understand that planetâ s orbit stars and that these planets may contain intelligent life.

3) They use numbers and almost certainly have developed mathematics of a very sophisticated sort needed to design and build their transmitter.

4) They, or some groups among them, desire to communicate with other life forms. Thus, they are not isolationist.

5) They have division of labor within their social order. This would be necessary to build the transmitter.

6) Their society is a relatively wealthy one since they have excess resources to devote to the very expensive enterprise of attempting to contact other civilizations.

7) They understand the complex engineering, mining, metallurgical, and electromechanical processes necessary to build the transmitters, obtain and refine the materials necessary for their construction, and generate the tremendous power necessary to transmit. They probably have processes for generating electricity at least as sophisticated as our own.

â Given that they know so much, one cannot help but wonder what else they may have to teach us, what other information is locked in this electronic song sung by our brothers on Beta Centauri 130 years ago. It is with great, almost inexpressible frustration that I report to you now that we have only two additional bits of information to add to what I have just listed: trivial bits of information compared to what we had hoped to discover:

8) They apparently have a base 13 number system. We conclude this from the fact that their acquisition signal ended at 13 pulses and the fact that the time interval between the series of transmissions is equivalent to 132 of their basic time units.

9) Their basic time unit, similar to our second, is equal to about .7381 seconds.

â The fact that my staff and I have not been able to extract more information from these transmissions proves only one thing; that we must increase our efforts, bring more resources and talent into the project, and persevere, until we have solved the puzzle of the code. This is potentially the most significant problem in the history of science; perhaps in the history of humanity. We must and we shall solve it!â

"It took about five years for every one of those assumptions to be thoroughly debunked," Smith mused as he riffled the pages of the book, dirty from so many re-readings. "Maybe the signals were from automatic machinery surrounded by a civilization falling into ruins. Maybe 'our brothers' are simply able to control some natural radio source with incomprehensibly alien technology. Maybe they are even generating the radio signals out of their own bodies through some totally alien biological process (assuming they even have bodies, etc., etc.)." He was well aware of the alternative speculations. "Basically, we know absolutely nothing except that somehow, radio signals got from their planet to ours."

Smith tossed the book onto a table across the room and watched it slide gently off the mound of papers onto the floor, his morningâ s correspondence fluttering after it. He turned back with deadening depression to the article, letting his gaze drift from paragraph to paragraph till he settled on one:

â The staff of the newly formed Center for Exocryptography began preparing for other messages from Beta Centauri (on the assumption that the Beta Cantaurians would feel obliged to explain themselves) and the development of a set of alternate theories about the meaning of the Numbers. The discipline of Exocryptography became one of the most exciting adventures in science, devoted to the development of beautiful, elegant theories consistent with the basic framework of the transmissions. Attempts to break the code became the occupation of the finest minds on the planet. It was the most elaborate and important game ever played by our species.

â Within a year, the following events had taken place:

1) Approximately Â½ of the listening time at the world's twenty largest radio telescopes was now devoted either to observing the emissions from Beta Centauri or to scans of other stars in the hope of finding similar transmissions.

2) New larger arrays of radio telescopes were being built by the U.S. and at least 70 other countries. A small number of joint projects had begun but these were limited by the complexities of international relations.

3) Courses in subjects related to the transmissions were being offered in every major university and some faculty began to specialize in this subject. Doctoral programs were also being discussed.

â The following year brought larger expenditures and larger disappointments in both scanning and interpretation. By the end of this year, the number of stars scanned had increased into the millions. However, no further transmissions were intercepted. The failures in the deciphering of the transmissions were even more disappointing.â

"Damned straight," Smith blurted out. Embarrassed by the sound, he turned quickly back to the article.

â At this time, I began to devote myself full-time to the task of decoding the transmissions. our efforts involved an increasing number of faculty, staff, and doctoral students from a broad range of disciplines. At first, only astronomers and computer science faculty were involved but soon linguists, anthropologists, sociologists, and psychologists were also included. Finally, nearly every discipline on campus had representatives working on the project. Post-doctoral students and faculty on sabbatical joined us in increasing numbers.

â The fascinating results of this collaboration are widely known. Indeed, it may be said that fundamental advances in every field of scholarship developed from this work. Positive results on the translation, however, were not forthcoming.

â It was generally assumed that the final answer, the decoded message, would come from the Center. However, journals in the newly emerging field encouraged papers from all researchers, whether they were associated with the Center or not. As I wrote in the editorial statement in the first issue of Exocryptography, since the translation will affect all humanity equally, it is totally inappropriate for a scientific elite to be the only ones involved in breaking the code. Our brothers on Beta Centauri did not send the message specifically to me at Arecibo or to any other specific group on this planet. Therefore, I will not limit access to the journal to any specific individuals or groups.â

â That policy probably did more than anything to produce his final breakdown," Smith noted mentally.

â However, when five years had passed, and the Center could report only a lengthy list of disproved hypotheses, articles of a more pessimistic tone began to appear in the field's journals. Articles of this type were read with chagrin and terror by newly minted Ph.D.s in the discipline.â

â Mallard could be making an oblique reference to me" thought Smith. "I certainly expressed those thoughts and terrors often enough.â

â The basic problem, of course, had to do with the nature of the transmissions. We had hoped that communications from stellar intelligences would be in the form of a picture message composed of binary pulses. Once it was proven that the Numbers are not a code for a picture in any number of dimensions (see the brilliant doctoral dissertation by Anton Rubidnikov for the mathematical proof) the search began for their real significance. Codes involving atomic weights, various fractions of the speed of light, the conversion of mass into energy, and other presumed universal constants all proved to be inconsistent with the data.â

Smith raised his head from the article and turned to the left to view his photograph of the full moon hanging on the wall. He looked at the huge white impact crater; particles from the impact spread 1000 miles across the moon's surface. The Mare Nubium above it looked like a great ocean of ink. Smith grinned again at the thought that people once believed there might be life on that airless rock.

"Mallard never understood the real problem in decoding the Numbers", he mused. "None of the early exocryptographers did. Their views on alien psychology were too narrow."Smith was the first to use the term, "terracentric" to describe this narrow view in a paper he had written four years ago on the psychological aspects of communication with alien life forms. It had appeared in Methodological Advances in Exocryptography (Academic Press, 2003). He retrieved the dark gray book from the corner of the lowest shelf of the bookcase where he had placed it in a fit of false modesty. He opened it to the paper clipped page and read the section circled in blue ink:

â Wittgenstein's writings give us some insight into the possibility of translating the message from the presumed beings on Beta Centauri. It is important to remember that our biology determines our perceptions of the world and that our perceptions determine our concepts, categories, and our general view of the world. Sight is our most important sense and it determines the kinds of concepts we hold. The only reason we can communicate (after a fashion) with other human beings is that we are biologically very similar. Chomsky (1959) has even suggested that we share a biologically-based conceptual structure though Skinner (1969) and others dispute this.

â Even a lion, a creature who evolved in the same earth environment, is so different from us biologically that we might have no common concepts as a basis for communication. How would an animal who relies primarily on hearing and smell conceptualize the world? What concepts would be held by a creature who does not have the digits to manipulate tools; a creature who views the world from a base of four feet rather than two? Our brothers on Beta Centauri are the product of a totally alien evolutionary process. The odds against them sharing any concepts with us are incalculable.

â Though we know nothing about those who sent the Numbers, everyone has opinions on the subject. The Numbers act as a kind of Rorschach test, as a background for peoples' speculations about the nature of the Beta Centaurans. Indeed, several very good doctoral dissertations have written on the correlations between peoples' personality traits and their thoughts about our brothers. Paranoid persons viewed the aliens as secretive and probably hostile. Compulsive persons saw them as extremely intelligent, emotionless technocrats. One widely-used personality test (the BCAT: Beta Centauran Associates Test) is based on peoples' perceptions of the intelligence behind the Numbers. It is less widely used today, of course, since the Numbers occupy less of peoples' conscious attention.â

"That caused a bit of a stir in the profession,â Smith thought as he gently closed the book and placed it in a more prominent place in the bookcase. "Probably got me the job at Winnemac." He returned to Mallard's article.

â In my book, Schools of Interpretation I myself suggested the basic ground rules for interpretation by listing several blind alleys (Mallard, 1990). First, the Numbers are not likely to be sentences in the sense we understand them because of the lack of repetition of symbols. Second, they do not represent any simple mathematical progression. Very complex progressions, however, did seem possible and several were being investigated. Third, each row or line is likely to have a unique meaning or to be distinct in some significant way from the others. Though I felt these three propositions were self-evident at the time, have been the subject of violent controversy ever since.

â Hatchworth (1990) was the first to advance the proposition that the transmitter on Beta Centauri might be a kind of navigational beacon for use by those traveling in space near the planet. He hypothesized that the Numbers might represent frequencies on the radio spectrum at which additional information might be found. This proposition stimulated some very serious and sophisticated Radio astronomy research. Sadly, this research failed to yield even a particle of support for the theory.

â Craig Ventner, spokesperson for the Human Genome Project, argued from the perspective of the life sciences and genetics in particular (see Ventner, 2000). He reasoned that the Beta Centauarans would send a message dealing with what was most important to them. As a geneticist, Ventner naturally assumed that the most important thing to any intelligent life form would be its own representation of its biological makeup. Thus, he postulated that the Numbers represent something similar to our own genome map or some other basic biochemical description. This theory has generally been discounted by those in other disciplines who do not share geneticistsâ assumption that the most important thing to any species is its own biological makeup.

â Marschack (1991) represents the contribution of the musicologists and music theorists to the translation of the Numbers. Starting with the vigorously-defended assumption that they represented points on some type of musical scale, adherents of this school produced numerous algorithms for developing a basic melody from them. Different algorithms, of course, produced different basic melodies, with no criteria for distinguishing between them other than human aesthetic preferences. Protestations from the members of this school to the contrary notwithstanding, it is generally agreed today that, while the inhabitants of Beta Centauri may have wanted to communicate on an aesthetic rather than a technological level, it is unreasonable to assume that aesthetic standards are consistent between beings who are the products of two totally different evolutionary processes. This consensus is, of course, not shared by the popular press.

â By 1993, opinion had generally shifted toward the proposition advocated by Ainsworth (1992); that each of the Numbers refers to some sort of basic physical unit like our atom. Thus, the entire set of Numbers describes a relationship between atoms or subatomic particles. Ainsworth herself originally believed that the Numbers might in some way represent a complex organic molecule, perhaps the basic chemical unit of life on Beta Centauri, like our own DNA molecule. Though this position is no longer favored, proponents of the Ainsworth school, including Ventner, continue to seek the meaning of the Numbers in terms of possible structures for subatomic particles.

Compton (1995), a brilliant mathematician, suggested that the Numbers all represent approximate distances from Beta Centauri to other stars circled by planets with communicating civilizations. According to Compton, the zero in the twelfth position in the third group of Numbers represents Beta Centauri itself. Thus, the Numbers represent a map of a great communicating network. Through a complex multidimensional scaling procedure, Compton developed a map in 3-dimensional space which had an approximate fit with Beta Centauri's local stars. The fact that the stars move with respect to each other lead him to suggest that we might someday expect a new set of transmissions which would constitute an updated star chart. Intensive radio scans of Compton's stars, however, has revealed no evidence of transmissions from any of them. Further, no "updated star chart" has been received from Beta Centauri.

â Surak (1997) clearly expressed the view of the school of interpretation now bearing his name, that the Numbers represent some form of equation. This school focused on the gap in the twelfth position of the third group, which is generally assumed to represent zero. Proponents of this school assumed instead that the gap expresses an equivalency sign dividing the first and second groups of numbers. This school has produced a tremendous amount of fascinating research. Through incredibly abstruse developments in mathematical Exocryptography, proponents of this school have developed a number of possible equations. Unfortunately, no basis for choosing between them can be found.

â Corwin (1995) represents the best contribution from the organizational theory to the confusion of theories about the numbers. He drew on the pioneering work of Graham Allison, The Essence of Decision (1971). Allison noted that any organizational or social decision can be explained not only as a rational choice designed to reach an objective, but also as a product of organizational routines and political bargaining. He suggested that the same must be true for decisions made by any intelligent beings, including those who sent the numbers. He argued that each of the lines of numbers represented a different power faction within the society and each line must be understood in opposition to the other lines.

â J. D. Lewis-Williams (1998) took the perspective of an anthropologist. As a well-respected researcher in paleolithic art, he drew parallels between the history of interpretation of this art and interpretation of the Numbers. He argued that we must abandon the effort to explain the whole of the message, just as anthropologists abandoned he effort to find a single unifying framework for explaining all cave art. Lewis-Williams suggested that we should focus on explaining clusters of the numbers, and claimed to have identified five clusters that merited further attention by scholars.

â These are generally recognized to be the major schools of interpretation in exocryptography at the present time. Of course, there are variations on each and a number of promising streams of research which do not fit within any school. The best summary of these is found the massive work edited by Hatchworth, Approaches to Exocryptography (New York: Scientific Press, 2002).

GO TO PART 2