

Modeling the Chaosphere: Stanislaw Lem's Alien Communications

Istvan Csicsery-Ronay, Jr.

(First published in *Chaos and Order. Complex Dynamics in Literature and Science*. Ed. N. Katherine Hayles. Chicago: U. of Chicago Press, 1991. 244-62.)

I. Carousel Reasoning

If there is a single theme informing all of Stanislaw Lem's mature work, it is the problem of "carousel reasoning." To different degrees and in different solutions, in grotesque, playful, realistic, and discursive modes, as explicit dilemma or implicit inscription, Lem's writing returns incessantly to this problem, which represents for him the fundamental paradox of both writing and scientific cognition. "Carousel reasoning," according to Lem's clearest fictional mouthpiece, the mathematician Hogarth of *His Master's Voice*, consists of carrying reflection within a logical system to the point where premises and conclusions exchange places. As the rational carousel goes round, the reasoner discovers that her premises depend upon her conclusions, that her thinking consists of combining and recombining elements and operations until proving and assuming are indistinguishable.

For Lem, as for Hogarth, "carousel reasoning" is an inherent flaw in all philosophical world models, since "they do not contain appeals to some decisive factor in favor of a given proposal" (Csicsery-Ronay 250). Philosophers, Hogarth claims, strive to define the position of human intelligence in the order of things by "equating [themselves] with the norm of the species" (*His Master's Voice* 30); unlike scientists, their thinking does not "come up against some hard focal point of facts that sobers and corrects it" (29). Without such a focal point, reason has no horizon toward which to orient itself, and no world of difference against which to test itself.

Scientific rationality escapes the carousel as long as it has "the facts." But as Hogarth knows very well, no facts exist truly outside the matrix of science's rationalistic assumptions. When scientists encounter completely unfamiliar or unstructurable phenomena -- anomalies, "aliens," "chaoses" -- they, too, become philosophers on the carousel. Lem, the fantasist of methodology, specializes in inventing such flummoxing anomalies. His fantastic scientists can break down these rational enigmas and combine their parts according to previously effective norms of science; but the resulting knowledge is in bad faith, since the enigmas call into question not the details but the ground of scientific reason itself. The "carousel," moreover, need not be confined to any one discipline or ethic. Given the great variety of theoretical models available from the history of the different sciences, the search for the right combination of hypotheses and norms leads to the relativization and devaluation of all. Hence the recurring motif of the informational labyrinth through which Lem's protagonists wander: the Library in *Solaris*, the maze of messages in *Memoirs Found in a Bathtub*, the carousel of hypotheses in *His Master's Voice*, culminating in the anthologies of imaginary textual fragments in *A Perfect*

Vacuum and Imaginary Magnitude. In the face of truly alien realities, there is little left for science to do but affirm their existence.

II. The Chaosphere

Katherine Hayles has described the "dialectic" between textual closure and openness in Lem's writing as an incessant movement from one extreme to the other, in which the logical development of either principle leads to its own undermining.¹ "Whether the text begins with order or chance, referentiality or self-referentiality, by the end both polarities have been so enfolded into each other by the operation of the dialectic that they are inextricable" (Hayles 297). This mutual enfolding of opposites is a version of carousel reasoning. The term "dialectic" is Lem's own ("Chance and Order" 88); yet it is saturated with irony. For dialectical interplay in Lem's work is implosive. Rather than extending the text, the dialectic sets up diverse significations that fuse with one another. Like Hegel's dialectic of the Spirit of Reason, Lem's also has a "spirit" propelling it toward a moment of absolute self-consciousness. Lem's spirit, however, is parodic,² driving thought with inexorable and binding logic toward self-enclosure in a sealed bubble of solipsism. Finally, it is articulated only by echoes, reflections, and replications of itself.

Science, the reference and concern of Lem's textual play, is involved in the same mutual enfolding of polarities that Hayles describes. Fundamental categorical differences that enable scientific epistemology to work -- space, time, mathematical relations -- dissolve when the horizon implodes. In a universe where origin becomes telos, containment becomes emptiness, identity becomes difference, the spatial universe becomes a temporal moment, and information becomes mass and energy, Lem's protagonists are haunted by a parodic consummation of history. Instead of the systematic unification of the ontological oppositions, Lem's scientists experience self-conscious isolation within the self-elaborating confines of systematic rationalization. Once absolute differences have been dissolved and enclosed within rationality, there is no way to set up a logical system -- a matrix, a language, a unified science -- which can be tested against anything distinct from itself. The system has become so self-inclusive that it no longer has an outside; it has neither ground nor relation. It is nowhere, at no time, compared to nothing. A singularity, in which ratio steps into the chaos of absolute non-relation. The chaosphere.

III. Fantastic Science

Lem's fantastic science allows for three possible stances toward this singularization. One option is represented by the constructors. These technologists of artificial intelligence³ treat the enclosing chaos as a void into which they project models of human consciousness. They are "creators" of new realities, in that their self-projecting constructs also imitate freedom. The constructors' creations, from the "personoids" of "Non Serviam" and the homunculi of "Doctor Diagoras" to the meta-AIs of "Lymphater's Formula" and *Golem XIV*, are creatures of universes that are "fully rational, but they are not fully rational inhabitants of them" (see for example

"Non Serviam"). Although the promise of self-organization, and indeed transcendence, exists in these creations (cf. Hayles 300-301), this self-projective modeling inevitably leads to an extension of the circular chaosphere and not a liberation.

Another school of Lem's fantastic scientists pursue randomness. There is Inspector Gregory's dogged search for a criminal perpetrator in *The Investigation*; ex-astronaut Adams's analogous quest in *Chain of Chance*; the indissoluble uncertainty in *His Master's Voice* about whether the message is an intentional object or an unknown natural process. Since randomness can never be brought into relation, ratio, it cannot open up a hyperrational system. Except perhaps for *The Investigation* (and satirically in "De Impossibilitate Vitae et De Impossibilitate Cognoscendi" of *A Perfect Vacuum*), the chance-novels tend to resolve the problem randomness poses for plot construction by dissolving it or explaining it away.

Lem discusses the privileged role of randomness has for contemporary fiction in his "Metafantasia." He argues that the last set of norms against which writers can try to perform their fictive transgressions is the all-embracing causal explanation of conventional science.

If we posit that the task of literature is not to ever give a definitive explanation of what it presents, and is therefore to affirm the autonomy of certain enigmas rather than to enter into explanations, then the most enigmatic of possible enigmas is a purely random series. ("Metafantasia" 65)

The affirmation of literature's enigmatic qualities appears in such hypermodern experiments as chance-poetry, cut-ups, and the random sequencing of some of Robbe-Grillet's works. But the enigma of chance, intended to liberate the work by undermining an overdefining cultural context, is itself undermined by the defining enclosure of the text. The reader knows that the chance is a product of the writer's design and hence an intentional procedure, not the "real thing." Instead of opening the field of signification to chance, such works merely simulate chaos, representing it as a usable disorder at the service of an expansive determining order.

There are thus two forms of modeling-constructing something out of oneself, which leads to the infinite labyrinths of self-referentiality, and simulating chance, which paradoxically neutralizes randomness's capacity to open the solipsistic enclosures of Lem's self-referential texts. Lem entertains one other form of fantastic modeling, balanced between these two. It is a mode that simultaneously valorizes the unexpected and forges a relation that will make these outposts of the inexplicable relevant for human concerns. This mode is the encounter of human reason with alien minds that are fundamentally different, and yet which share with human consciousness the ability to make models. The quest for extraterrestrial contact informing much of Lem's best writing, from *Solaris* and *His Master's Voice* to *Summa Technologiae*, is not so much a search for a ground for reason, or for an absolute Other, as for a difference in relation to which human consciousness can position itself. The alien represents the only chance of the human species for a relation not subsumed within the chaosphere.

Modeling in Lem's fiction can be a passive reading of nature or an active construction that commands nature to behave a certain way. Both of these orientations result in anthropomorphic self-projection, since both end in a universe defined in human terms. A third mode also exists: appealing to nature. This form of modeling represents science as a Heisenbergian activity, asking nature to make specific responses to specific questions.⁴ In Lem's novels of alien communications, scientist-protagonists search the universe for signs of design and intention other than their own, and they are usually strict in their empirical standards. Their goal is the construction of communication, not an oceanic fusing with science-fiction demiurges who require the self-annihilation of the questing intellect.⁵ Since humanity in its auto-evolutionary phase is, for Lem, a self-constructing species condemned to making its own decisions about its fate, it cannot expect to communicate with a subject incapable of constructing itself. Human beings can only hope to extract a response from something that also desires a response. Lem's questers are out to gain greater purpose through freely entered dialogue. To maintain autonomy, the communication must be constructed; it must be dialogical. This can only happen through models of communication that mediate between one self-conscious species and another.

What kind of match will there be between terrestrial and extraterrestrial models? Even if mind is a normal phenomenon in the universe, it may not be uniform. In Lem's fiction there is only one form of naturally evolved mind that can have a lasting interest for us: an analogue of our own, that is, mortal self-consciousness, having in common with us awareness of its incompleteness, ignorance of its direction, and knowledge of the tools of communication. The mind with which we can communicate must be an imaginative intellect with the power to have goals (cf. Minsky 126-27), and to make models of them. It must have the capacity to imagine the universe as a totality in which intelligence has a part, and the certainty that its image of the universe is inevitably incomplete -- that it can, at best, only model the chaosphere. Only such beings can offer the promise of modeling which may lead to alien contacts, or at least to the knowledge that such contact might have been possible, once, for someone, even if not for us.

In the pages that follow, I will sketch how three of Lem's most important fictions of extraterrestrial communications show his stances toward escape from the chaosphere: the romantic contact of *Solaris*, the indeterminacy of *His Master's Voice*, and the demonic recursion of Lem's latest novel, *Fiasco*.

IV. *Solaris*: The Human Model

In Lem's first major work, *Solaris* (1960), the chaosphere is represented by Solaristics, the branch of earthly science that evolved through humankind's encounter with the gigantic sentient colloidal ocean of the planet Solaris. The planet is known to be capable of incredible self-regulation, governing its macroprocesses by controlling its orbit around two suns, and also its microprocesses by the manipulation of neutrino-fields to create phantasmic simulacra of human beings. After the discovery of Solaris, the desire to understand the ocean became for a time the greatest quest in science. But when the novel's protagonist, psychosolarist Kris Kelvin,

arrives at the Solaris Research Station, Solaristics is a badly degenerating research program. After a hundred years of study, the Solaris Project has produced only stalemate and paradox.

The planet has resisted scientific categorization so much that each scientist, and each discipline, are caught in escalating complexities, ultimately forcing them to step out of scientific rationality altogether. First came the competition of very general hypotheses. The biologists defined the ocean-planet as a gigantic "prebiological" quasi-cell; the astrophysicists as an extraordinarily evolved organic structure; the planetologists proposed that it was a "parabiological" plasmic mechanism; some even argued that it was merely a very unusual geological formation. The evolutionary view entered with the hypothesis that it was a "homeostatic ocean" which had evolved into total adaptive control of its cosmic environment in a single bound, bypassing the phases of cellular differentiation (*Solaris* 23-25).

Some things have been determined with precision: the planet controls its orbital periodicity directly, and discrepancies of time-measurement are discovered even along the same meridian. But very little mathematical certainty is possible, since the planet often changed the measuring devices applied to it, and the human scientists no longer know exactly what their readings were registering. Solaris acts as a macrocosmic uncertainty generator.

In the "golden age" of Solaristics, bold theorists and heroic explorers willing to risk their lives established that the ocean is alive, in some sense. But because the planet did not respond to the Solarists' probing, the work increasingly declined into taxonomy -- an excruciatingly ironic taxonomy since everything about the planet was unprecedented in human science, and all relevant categories had to be invented from scratch, without comparisons.

It was in this phase that the Solarists descended to the surface of the planet to study its "inventions," the so-called symmetriads, mimoids, and asymmetriads. These are gigantic, intricate structures that emerge for short periods from the ocean's surface. Neither their purpose nor their principles of construction are intelligible. The scientists cannot determine whether they are adaptive, exploratory, or aesthetic -- but each commentator betrays unconscious perceptual biases in his descriptions of them. The strongest proponents of the planet's intelligence were the explorers who approached and entered these awesome constructions. But the same things that led to artistic awe led also to scientific despair. A bitter split developed between those who wished to withdraw from the project, believing the planet was somehow willfully refusing to communicate, and those for whom contact with Solaris became the be-all and end-all. Lem brilliantly ties this to a psychoanalysis of science. The demoralized Solarists are like insulted suitors, and the contact-men are only made more ardent by the lack of response. Ultimately, the planet will understand this better than the men themselves, when it sends embodiments of their unconscious erotic fantasies and guilts to "visit" them.

Frustration at their inability to understand the planet gradually leads the Solarists to make increasingly psychological hypotheses. The planet's silence is viewed by some as a sign of

autism, by others as a sign of an "ocean yogi." Ultimately, the Solarists are compelled toward models of intentional behavior taken from terrestrial religions. Observers plausibly depict the scientists' obsession with communicating with the ocean as narcissistic projection or religious mania, the desire for union with the Godhead. For other scientists, the uncategorizable translates into indifference, or even active hostility. The scientific gain from the study of Solaris is nil. The sciences are ironically unified by their universal failure to interpret the Alien, ultimately collapsing into one another. The myriad models used by the generations of Solarists prove to be anthropomorphic analogies with no demonstrable relevance to the sentient ocean. At the moment of complete stalemate (the actual beginning of the novel's action), the planet appears to have defeated human science altogether by establishing unpassable limits. Knowledge appears to have become a library of self-contained cross-references; the only thing leading out of the system is the human desire to make contact with what is not itself.

A breakthrough comes with the "Visitors," who appear to be materialized forms of the scientists' own unconscious thoughts (142). To be more precise, the breakthrough is the Visitor – Rheya ("Harey" in the original Polish), a simulacrum of Kelvin's dead young wife, for whose suicide he has carried feelings of guilt for several years. Rheya differs from the other scientists' Visitors primarily because she is clearly a model of the human original. She is like the authentic Rheya in several ways: indistinguishable in appearance, she attempts to emulate the original's suicide and inspires feelings of love and guilt in Kelvin. She is also, like a model, different than the original in important ways. She has superhuman strength and no memory of her previous life. Physically, she is a formal copy taken from Kelvin's memory. Her dress, for example, has no buttons or zippers (implying perhaps that Kelvin was not the most attentive lover of the original woman).

The Visitor-Rheya appears to be a model created by the ocean, modeling Kelvin's memory of the authentic Rheya. But it is a property of the Visitors that the longer they remain with their hosts, the more autonomous they become. The simulacral Rheya gradually becomes almost as human as Kelvin -- as aware of her ignorance of her origins, as capable of cunning judgment, as capable of self-sacrifice. She appears to evolve into a self-regulating Solarian model of a human being. Physically, she is different; she is composed of neutrinos organized in a neutrino field apparently under the planet's control. But the structure of her behavioral autonomy is isomorphic with human behavior.

Rheya's modeling appears to mediate between Solaris and Kelvin. Her form is imparted by Kelvin through his unconscious memories; her material, the neutrino field, apparently by Solaris. Her modeling function also appears to be determined by the ocean, at least in the beginning. But though she may be an observation device, she is most likely a self-programming one (Philmus 185). Her autonomy -- which may be functionally necessary in order to evoke Kelvin's love and her own sacrifice -- appears to be necessary for the Solarian ocean to make experimental changes in Kelvin's unconscious mind (or whatever it is that keeps him, like other humans, from getting through to the ocean). For the ocean, she may be a model of Kelvin's

emotions and the psychic behavior of individual (male) human beings. For Kelvin, she is a model of the ocean's power to model and hence to understand. She is the most complete example of the Solarian models of the human image that the ocean had begun, in a process the scientist Messenger had called "Operation Man," to create, beginning with the grotesque gigantic baby drawn from the memories of Berton, an early Solarist who crashed into the planet (*Solaris* 97). The fact that the Visitor Rheya does not return in a new version after her annihilation, as all other versions did, seems to indicate that her purpose was successfully achieved, and now she can be discarded. One might argue that several powerful distracting disanalogies in the model -- such as the growing love-affair between her and Kelvin, and possible future misunderstandings between two fully autonomous beings -- threaten to develop, which might severely interfere with the planet's project of cognition.

Whatever the case may be, Rheya's existence and behavior imply the planet's prodigious model-making sentience. Through the anthropomorphic model, the ocean-consciousness appears to have established a form of contact with the alien world of human beings. Thus the Solarian ocean appears to be capable of higher level modeling (the imitation of intelligent organic structures) than human beings. It is capable of the highest conceivable form of model, a creature capable of acting with increasing freedom, and whose illuminating and theory-fertilizing function can only be realized by a response from her human co-creators.

The problem with such a model is that its "fit" cannot be judged by a putatively autonomous, conscious human being without some independent standard to which both creatures might be compared, a metamodel. It is precisely the freedom of human consciousness to recognize and act on something other than anthropotropy that Lem's novel questions. The Visitor-Rheya is a human model, a simulacrum, who reproduces the uncertainty of human cognition, the uncertainty of humanity's place in the universe. Indeed, she redoubles this uncertainty. This redoubling might mean one of two things. Either the further displacement of meaning, in the shape of yet another unanswered question embodied in the universe; or, on the contrary, the creation of a being with which there can be affective contact, of a medium of communication. The human image is then either a form of chaos, an echo instead of a reply, or the agent of order, the messenger, the reply to a question at the heart of being human.

Everything in *Solaris* hinges on how we decide this question. But it cannot be decided. The unified chaos of the novel does not appear in the action; it is not an object of storytelling. It appears, rather, in the wedge between two mutually incompatible but equally compelling readings: a straightforward romance of superrational contact with the alien, and an ironic, self-deconstructing satire of it.⁶ However one reads the novel, it is undeniable that contact in terms of the novel can only be made through the mediation of models. In *Solaris*, human science was fortunate enough to happen on a being willing and able to initiate the kind of modeling that can get to the heart of intelligent beings through mutually constructed models of communication.

V. *His Master's Voice*: The Pure Model

With *His Master's Voice* (1968) the theme of alien communications again comes to the center of Lem's fiction. As in *Solaris*, terrestrial science is faced with a mysterious cosmic phenomenon it does not have the conceptual tools to comprehend. An enormously long and regularly repeated emission of neutrinos that has apparently been streaming from space for millennia is discovered by chance. A team of scientists is quickly assembled by the Pentagon to study the emission in a program explicitly reminiscent of the Manhattan Project. As with *Solaristics*, the study of the "letter from the stars" begins with a wide range of general hypotheses which are gradually narrowed down, and whole sciences and disciplines are discarded in the process. Unlike *Solaris*, the impenetrable phenomenon in *His Master's Voice* is most likely not a naturally evolved structure but an informational-artifact, perhaps a message sent by intentional beings.

One can read *Solaris*'s conclusion to say that the *Solaris* problem is ultimately resolved by benevolent telepathy; Rhey's modeling-mediation was apparently made possible by the ocean's penetration of the human *Solarists*' minds. The sentient ocean worked in a domain where autonomy is a given. Since earthly science does not work with self-transforming models, communication with an alien whose entire being seems to express itself in creating such objects was largely out of human hands from the start. Human science deals either with already coded information, or it translates ("interprets") phenomena into coded information, which is one of the functions of a scientific model.

In this sense, the "letter from the stars" is the opposite of the sentient ocean. It cannot be changed, it cannot respond, but as a severely regular text it might at least provide the information necessary for understanding its structure. In fact, it proves too complete even for this. Where the *Solarian* ocean was too fluid to be understood by human scientists, the "letter from the stars" is too self-integrated; while the ocean granted Kelvin a modeled context in the form of a personal love, the "letter" lacks all context.

Even so, the novel's narrator, Hogarth, a curmudgeonly Nobel laureate in mathematics, is able to discover two unambiguous pieces of information about the neutrino stream. First, the "message" is closed, it has the structure of an object. Second, it is not binary, i.e., the code's form is finer than the interpretive capacities of the terrestrial receiving instruments. The first discovery means that the message can be viewed as a whole, but also that it does not point to a context necessary for its interpretation. It may be hermetically self-reflexive, capable of being understood only by those who already know what it means. The second discovery means that the message cannot be accurately interpreted even if the "code" as it is received is "cracked," since the instrumental limitations of earthly science prevent the whole text from arriving. Neither of these discoveries discourages the project's physicists from extracting what they consider usable information from the letter and treating it as if it were inherent in the message.

The ocean had intervened in the *Solaris* project in response to the human *Solarists*' earlier attempts to intervene in its processes. (The apparent immediate catalyst to the Visitations was

an emission of X rays from the Solaris Station to the surface of the planet.) *Solaris* thus depicts a dialogue of models. But the letter of *His Master's Voice* can work in one direction only; furthermore, if it truly had Senders, they certainly would have been dead for millions of years. Neither the code nor its Senders can respond. And since the letter is closed, the potential analogies to be used in models of it must also be completely closed. The only such analogies available to the "His Master's Voice Project" are objects defined by the Schwarzschild radius, like black holes, or perhaps the universe itself -- in other words, an object whose only outward-directed information is the absence of information.

This stalemate is dislodged when it is discovered that the neutrino stream is "biophilic," in two senses. First, it slightly strengthens the survival chances of certain macromolecules essential for life in systems already tending toward biological self-organization. Hence, since the Earth was evidently in the path of the emission for millions of years, the code may have influenced the emergence of life. Later, another aspect of its biophilia is discovered. The project's physicists manage to synthesize from their putative decodings a substance capable of a "tele-explosive," or TX-effect. In the end, Hogarth determines that the TX-effect is limited in range. Moreover, beyond a certain short distance it has an inverse effect. Thus the substance cannot be used a weapon, since it would annihilate its wielders and not its target. Hogarth speculates that this limitation is a matter of an internal precaution deliberately inscribed throughout the whole message by the Senders. The message therefore represents for him a pure communication, in which technical and ethical purity coincide: it is incapable of being misunderstood and incapable of being used for harm.

In both *Solaris* and *His Master's Voice*, the creator-emitter is inaccessible, primarily because its powers of organization and energy-emission are unimaginably greater than humanity's. Their models, however, are not completely alien. Rheya is a person of sorts (although she can be viewed as a kind of self-elaborating readout of certain preprogrammed instructions, in this she is not unlike human beings vis a vis their genetic "programs"). The neutrino emission is a piece of organized information (although it still might be a natural phenomenon rather than a letter). There the similarity ends. A person can be engaged, influenced, loved. As Kelvin falls deeper and deeper into his quixotic love for the Visitor-Rheya, the lovers gradually transform each other, and he appears to make purely intuitive contact with her "source." Although the "personality" of the ocean cannot be inferred from its person-creature, there are reasons for believing that the ocean has the power to make precisely this sort of inference. The greater Kelvin's needful love for Rheya, the greater the mysterious apparent contact between the ocean and Kelvin.

The "letter," by contrast, cannot be engaged or influenced. The message's closure forces the project scientists to discard more and more hypotheses, yet they are given almost no new information about how they might approach the text. As the message resists all the methods and hypotheses in the armory of human science, the image of Senders becomes proportionally remote and finally empty. It is never decided whether the stream is an artifact or a natural

cosmic phenomenon. At the end of the novel, several models for the message's function are proposed: that it is the order-regenerating legacy bequeathed by the last civilization of a dying universe, that it is the imperishable impersonal information core of a universe that has passed into antimatter, that it is a purely unintentional cosmic excrement. These hypotheses can go nowhere, because the "letter" cannot be approached sufficiently for hypotheses to be verified or falsified. Because this hyperorganized stream of information cannot be deciphered, it is a model of the Cosmic Secret. Unlike the silence of the universe, which like chaos can never be studied since it implies nothing, the neutrino message may mean a great deal. Indeed, it may mean everything, the very existence of the universe.

Hogarth wants to believe that the stream truly is a message. That would mean that the Senders are sufficiently like humanity to be limited by mortality, a situation that requires them to use instrumental mediation. And precisely because they are mortal and scientific like us, the message shows that they are perfect by comparison. A culture whose moral perfection matches its technological perfection, capable of devoting their whole civilizational energy to broadcasting such a biophilic -- and perhaps even cosmophilic -- letter, means that the message is not for us. Still, given humanity's genius for destruction, it is comforting to know that such beings might exist.

In a sense, Lem's "letter" is a model of language as if seen from outside. Language, after all, is the fundamental modeler, the paradigmatic case of modeling. All the models of science must draw from or refer to the larger linguistic framework (including mathematics), or they would never fit into the larger pattern of scientific theory, let alone help to establish it. In *His Master's Voice* Lem "estranges" this self-evident and apparently trivial point, which ceases to be trivial whenever someone tries to imagine how to communicate with extraterrestrials. For the "letter" exemplifies the point at which information and noise become indistinguishable, just as the chance evolution of a material object and an intentional artifact become indistinguishable. The "letter" models an absence that unifies all human language, context, and reference into what is "outside" it. Paradoxically, human modeling is sufficiently parallel to the neutrino stream's order for us to be aware of our exclusion. Thus Hogarth's hope duplicates Kafka's: "There is hope, but not for us."

The Soviet critic Kagarlitsky called *Solaris* one of the most romantic works of science fiction (37). Contact is achieved (if it is achieved) through love, and the creation of a woman is used as an instrument of dialectical sublation. Moreover, the novel itself, considered as a model encompassing a story about modeling, similarly requires identification with the characters' struggles for contact in order to make sense of the whole. The novel can be simultaneously earnest and satirical, for it assumes the reader's interest in the alien. The novel's self-reflexive dimension appears once we identify the problem of reading the novel with the problem of understanding the Alien. If Kelvin can love Rheya and experience strange dreams apparently issuing from the planet, the reader can feel that the novel models the problem of knowing another subject directly.

His Master's Voice is, from this perspective, a more sophisticated and essentially postmodern work than *Solaris*, for it assumes that the problem of knowledge is the problem of language. At every turn in the novel, the reader is faced not merely with interpreting the mode in which the events of the text occur, but also with deciding whether the text even allows the possibility of interpretation. The Solarian ocean does not use language, or at least no language recognizable as such by the Solarists. By contrast, all that appears of the Senders in *His Master's Voice* is their language. Just as the text of the letter cannot be deciphered (or even determined to be intentional information) because it is so precisely defined that it reduces redundancy to zero, so the meaning of the story's events remains completely undecidable. In the end, one cannot tell whether *His Master's Voice* is a tale about the yearning for graceful cosmic power that can control the ambiguities of information, or about the impossibility of ever distinguishing chance from causal order.

VI. *Fiasco*: The Infernal Model

Lem did not return to the theme of extraterrestrial communication for twenty years. During that time, his fiction revolved almost exclusively around the theme of human self-projection; carousel reasoning replicated the human image in a technosphere that encountered no resistance from the material universe. With *Fiasco* (1987), Lem went back to the subject matter of his most successful fiction, returning as well to the ethical tone of his early novels. One can read *Fiasco* as a step that closes a grand circle in Lem's project of depicting the prison of carousel reasoning. The reprise of the naive ethical mode of Eastern European scientific fantasy occurs in such a tragic and mournful key, it would be unimaginable in any youthful work. *Fiasco* completes the circle of tales of alien contact, supplying the missing piece: contact leads the human explorers to destroy what they came to meet, and to destroy the ideals that led them to desire contact in the first place. Where *Solaris* conjured a romantic vision of miraculous contact with a superhuman being, and *His Master's Voice* the epistemological hopelessness of contact with superior civilizations, *Fiasco* depicts a version of chaos unmitigated by higher beings, a chaos in which utopian ideals and technology lead inexorably toward their own disintegration and war against the Other.

The novel's main action concerns an expedition of human scientists who set out to make actual physical contact with a distant stellar civilization that appears to be within the "window of contact," the historical interval during which a planetary civilization is no longer pretechnological but not yet technologically suicidal or isolationist. The expedition itself represents the acme of human civilization. The mother ship is a gigantic hydrogen-flowstream vessel; the crew is capable of "sidereal engineering"; their science is able to transform a black hole into an onion of time-space "skins," through which the mother ship can navigate several centuries in a few days. Yet, like the ideal Greek figures evoked by the novel's relentless allusions to classical myths of descent into the Underworld, the crew of the mother ship *Eurydice* and the landing vessel *Hermes* are drawn into an inexorable and terrible struggle with an inverted image of themselves.

As in all of Lem's fiction, the intellectual action moves from extremely broad hypotheses to ever narrower and more specific models, as the encounter with the mysterious phenomena intensifies. While the *Hermes* journeys toward its destination, its crew passes the time discussing various theories about the distribution of intelligent life in the universe, the probable kinds of intelligence, the plausible courses of civilizational development, and the possibilities for communication. As soon as they arrive in the solar system of the target planet, Quinta, the vague hypotheses are quickly sharpened by the practical need to make models of the inscrutable, but clearly dangerous, phenomena they observe. For everywhere, the *Hermes's* crew finds signs of war, extending to the outermost regions of the Quintan solar system.

This war appears to be conducted exclusively by self-regulating killer satellites, synthetic viruses, and related automata. The human explorers abandon their original plan of appearing directly to the Quintans; instead, they conceal themselves in order to study the civilization and its satellite-armory better. The weapons they observe are clearly cybernetic artifacts, not protean beings or uncrackable codes, yet even so they are impenetrable. The human emissaries are neither passively tolerated as in *Solaris*, nor simply in the path of a message as in *His Master's Voice*. Threatened by aggression, they must make their decisions quickly, under pressure. With the help of a pompous supercomputer named DEUS, the crew of the *Hermes* tries to make sense of the technology of the aggressive automata and of many unintelligible phenomena they observe on the planet itself. From this they hope to build up an image of the Quintans' motives, if not the rationale of the whole Quintan civilization. They must do this through abstract modeling, for the Quintans refuse to answer their attempts at communication, except through bizarre and apparently self-destructive acts of high-technological violence.

Gradually, DEUS and most of the crew agree that Quintan civilization occupies a special phase of technological evolution, in which it has transformed its whole solar system into a "cosmic war sphere." The aggression appears to have usurped the civilization's normal goals and functions, so that the war continues automatically. The entry of human beings endowed with sidereal engineering threatens, at the least, to inspire the Quintans to destroy themselves by appropriating that technology, or, at worst, to extend the boundaries of the war-sphere further into the universe. A representative of the Vatican accompanying the crew urges them to withdraw, leaving the Quintans to their own path lest, despite their good intentions, the human messengers should incite physical and ethical catastrophe. The astronauts believe they have no choice but to engage the Quintans in a form of escalating confrontation until the Others submit to civilizing communication with the representatives of Earth. The heroic honor of Earth's emissaries cannot allow either attacks or questions to go unanswered -- the code of exploratory desire takes precedence over humble renunciation.

At first, the Quintans do not respond at all except by violence. Later, when they do respond, they cannot be trusted. The human crew is consequently entirely at the mercy of its models of the situation. These models allow them to make rational moves toward their goal. The Quintans appear to be similar to human beings in their technology. Indeed for the reader, their runaway

Star Wars technology is far more familiar than the transgalactic utopian magnanimity of the human emissaries. Nor is the Quintans' behavior without terrestrial analogues. Even so, modeling leads the Hermes's crew not to rational compromise but to participation in a war game, and the desire for contact and communication becomes a catastrophic exercise in end-game theory. Where in the earlier novels the modeling-work of superior beings led to autonomy and grace (the "genesis" of Rheyra and "The Word" of the Master's Voice), in *Fiasco's* mindless conflict of technological civilizations, the modeling is demonic. When the novel's hero finally arrives on the surface of the planet (possible only after the humans threaten to destroy the planet by burning away its atmosphere and searing through the surface to the core) he discovers he is caught in a modeling-trap:

He found himself in a situation whose structure was typical of the algebra of conflicts. A player made a model of his opponent, a model that included the opponent's model of the situation, then responded to that with a model of a model of a model, and so on, ad infinitum. In such a game there were no longer any clear, reliable facts. Very tricky, he thought -- devilish. Better than instruments here would be an exorcist. (315)

The models do in fact lead to answers, but these look unnervingly like reflections of the modelers. Even DEUS's models can only be based on human analogues inscribed in its original program. Consequently, the models begin to draw the same human beings who undertook the project of contact with the greatest imaginable altruism and benevolence into a process in which they increasingly resemble the Quintans. Because of their superior technology, they become meta-Quintans. Rather than saving the alien civilization, they become agents of its destruction -- and perhaps of its self-destruction.

The models of the Quintans' autonomous war-sphere can only describe abstract relations, through mathematical systems like game theory, decision theory, and information theory. The domain of motives, values, and sufferings remains unintelligible in these systems. Neither the Quintans nor the human beings can create self-sacrificing "autonoms" or messages that cannot be misprised. In *Fiasco*, the model for the dialogue of models is war. Lacking the direct power of the Solaris ocean or the ideal tact that Hogarth attributes to the Senders, the one thing that the Quintans and the Earthmen have in common is their aggressive self-consciousness, which is thoroughly and ironically reflected in their technospheres. The models, rather than mediating between alien beings, create the illusion of understanding and the delusory promise of a reply. It ultimately proves easier for human beings to dock in a black hole than to establish communication with another cosmic culture.

In the sad and harrowing conclusion of the novel, its hero, Mark Tempe, whose whole life has been dedicated to actually seeing the Quintans, arrives on the planet as the emissary of Earth. He cannot be sure that anything he sees is authentically Quintan and not an ironic, inverted Quintan image of human models. When he begins a desperate search to find what a true Quintan looks like, Tempe loses his sense of time and forgets to send the crucial flare to alert

his shipmates that he is still alive. At the very moment that he does make physical contact with one of the Quintans, unexpectedly so unlike the humans with whom they have engaged in a war of hostile models, the hovering spaceship unleashes its solar laser, destroying its emissary along with the civilization with which it had come thousands of light-years to communicate.

With *Fiasco*, Lem depicts a vision of infernal modeling in which the models and their technological analogues prevent true encounter. In the absence of significantly different kinds of communication, the increasingly autonomous models draw the human emissaries into representing the alien Quintans' behavior in terms all too familiar in Earth's history: the familiarity of war, impatient honor, and the self-destruction of intelligence.

Notes

1. Much of my argument is indebted to Hayles's essay, "Space for Writing: Stanislaw Lem and the Dialectic 'That Guides My Pen.'"
2. Cf. Jarzelski's remarks on Lem's mockery of Hegelian rationalism in "Stanislaw Lem's STAR DIARIES" (370).
3. "Personetics" is the science of constructing artificial sentient beings via cybernetics (cf. "Non Serviam"); "fantomology" is the study of artificial realities "that are in no way distinguishable from normal reality by the intelligent beings that live in them, but which nonetheless obey rules deviating from that normal reality" (*Summa Technologiae* 4:171); "imitology" is the study of the construction of informational imitations of natural phenomena (4:162).
4. See Heisenberg's *Philosophic Problems* (73).
5. This is the burden of Lem's critique of Stapledon's *Star Maker* ("On Stapledon's *Star Maker*," 4).
6. The present reading of *Solaris* may appear rather "positive," especially compared with my own considerably more skeptical reading in an earlier essay ("The Book Is the Alien"), on which much of the present discussion draws. I do not believe I am contradicting myself, however. The reading of *Solaris* as an ironic metafictional and metascientific parable of undecideability requires that readers build up a realistic story and its negation simultaneously. The effect of undecideability could never happen if the realistic tale were not extremely carefully developed, and indeed the most attractive alternative. *Solaris*'s particular virtue in Lem's corpus is the power of the positive reading to resist the metalinguistic, a power usually reserved for the Pír tales, now including *Fiasco*.

Works Cited

Csicsery-Ronay, Istvan, Jr. "[The Book is the Alien: On Certain and Uncertain Readings of Lem's *Solaris*](#)." *Science Fiction Studies* 35 (1985): 6-21.

----- . "[Twenty Two Answers and Two Postscripts: An Interview with Stanislaw Lem.](#)" Trans. Marek Lugowski. *Science Fiction Studies* 40 (1986): 242-60.

Hayles, N. Katherine. "Space for Writing: Stanislaw Lem and the Dialectic that 'Guides My Pen'." *Science Fiction Studies* 40 (1986): 292-312.

Heisenberg, Werner. *The Philosophic Problems of Nuclear Science*. New York: Pantheon, 1952.

Jarzebski, Jerzy. "Stanislaw Lem's 'Star Diaries'." *Science Fiction Studies* 40 (1986): 361- 73.

Kagarlitski, Julius. "Realism and Fantasy." In *Science Fiction: The Other Side of Realism*. Ed. Thomas Claeson. Bowling Green: Bowling Green University Popular Press, 1971. 29-52.

Lem, Stanislaw. *A Perfect Vacuum*. Trans. Michael Kandel. New York: Harcourt Brace Jovanovich, 1983.

----- . *Chain of Chance*. Trans. Louise Iribane. New York: Harcourt Brace Jovanovich, 1984.

----- . "Chance and Order." Trans. Franz Rottensteiner. *The New Yorker* 30 January 1984.

----- . "De Impossibilitate Vitae et De Impossibilitate Cognoscendi." *A Perfect Vacuum* 141-66.

----- . "Doctor Diagoras." *Memoirs of a Space Traveller. Further Reminiscences of Ijon Tichy*. Trans. Joel Stern and Maria Swiecicka-Ziemianek. New York: Harcourt Brace Jovanovich, 1983.

----- . *Fiasco*. Trans. Michael Kandel. New York: Harcourt Brace Jovanovich, 1987.

----- . *Golem XIV*. Trans. Marc E. Heine. *Imaginary Magnitude* 97-248.

----- . *His Master's Voice*. Trans. Michael Kandel. New York: Harcourt Brace Jovanovich, 1983.

----- . *Imaginary Magnitude*. New York: Harcourt Brace Jovanovich, 1986.

----- . "Lymphater's Formula" ("Formula Lymphatera"). *Ksiega robotow*. Warsaw: Iskry, 1961.

----- . *Memoirs Found in a Bathtub*. Trans. Michael Kandel and Christine Rose. New York: Harcourt Brace Jovanovich, 1986.

----- . "Metafantasia: The Possibilities of Science Fiction." Trans. Etelka de Laczay & Istvan Csicsery_Ronay, Jr. In *Microworlds*. Ed. Franz Rottensteiner. New York: Harcourt Brace Jovanovich, 1984.

----- . "Non Serviam." *A Perfect Vacuum* 167-96.

----- . "On Stapledon's *Star Maker*." Trans. Istvan Csicsery-Ronay, Jr. *Science Fiction Studies* 41 (1987): 1-8.

_____. "Professor A. Donda." *Maska*. Krakow: Wydawnictwo Literackie, 1976.

_____. *Solaris*. Trans. Joanna Kilmartin and Steve Cox. New York: Berkely, 1971.

_____. *Summa Technologiae*. Budapest. 1976.

_____. *The Investigation*. Trans. Adele Milch. New York: Harcourt Brace Jovanovich, 1986.

_____. "The New Cosmogony." *A Perfect Vacuum*. 197-229.

Minsky, Marvin. "Why Intelligent Aliens Will Be Intelligible." *Extraterrestrials: Science and Alien Intelligence*. Ed. Edward Regis, Jr. Cambridge: Cambridge University Press, 1985. 117-28.