

The Play of Musement

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For E

--who equals the mass of her matter
multiplied by the speed of light squared

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Introduction: *Ludens in orbe terrarum*

THE KEY TO the title of this book is to be found in Peirce's profound study, in 1855-56, of Friedrich Schiller's concept of *Spieltrieb*. In his *Briefe über die ästhetische Erziehung des Menschen* (1794-95), Schiller presented an analysis of human nature as comprising three "impulses": *Stofftrieb*, the drive for diversity, forever striving for change, contrasted with *Formtrieb*, the demand for "form" in the abstract, alien to time, hence oppugnant to change (this pair corresponding to Kant's well-known dualism), plus a third component he himself dubbed *Spieltrieb*, or play (*ein ernstes Spiel*)—the aesthetic tendency, mediating and harmoniously reconciling the twofold way of sense and reason on the level of the individual's faculties (microcosmos, the particular) as well as those of society (macrocosmos, the lofty). Schiller (1967:331) defined *Trieb*e as "bodily needs inasmuch as they represent an incentive to mental activity," but then went on to use his compound in a substantially wider sense, continuously adapting it to his own purposes. In consequence, *Spieltrieb* has been much misunderstood (*ibid.*:clxxxvif.), although emphatically not so by Peirce, intent, as he was, "on uncovering the method and the message" of Schiller by a critical examination of his language (*ibid.*:clxxxviii). He undertook to expound the work to his classmate Horatio Paine, spending "every afternoon for long months upon it, picking the matter to pieces," eventually—no less than 47 years later—concluding that though "esthetics and logic seem, at first blush, to belong to different universes . . . that seeming is illusory, and that, on the contrary, logic needs the help of esthetics" (Peirce 2.197). Or again: "When our logic shall have paid its *devoirs* to Esthetics and the Ethics, it will be time for it to settle down to its regular business" (2.200). The two editors of Schiller's *Letters* point out the implied sequitur: "that logic rested on ethics, and ethics on aesthetics . . ." (1967:clxxxix). Further, Wilkinson and Willoughby underline the historically interesting fact that Peirce's "hierarchical structure" was very much akin to Schiller's own. At the same time, the most crucial and fundamental equation—of logic being only another name for *semiotic* (Peirce 2.227)—eludes them entirely. This is most unfortunate, and for two quite different reasons: First, because it blinds his astute editors to the possibility of an intellectually exciting semiotic revaluation of Schiller's philosophy—an opportunity that they missed, although they do hover at the very edge of discovery when they note that some recent investigations of both human and animal play have revealed it to be

"one of the primary message-systems, a means of communication" (Schiller 1967:clxxxvi, cf. Sebeok 1981). Second, they do not apprehend that Peirce imparted to Schiller's basic idea a voltage and dynamism precisely by virtue of its incorporation into what he called the third Universe of Experience, which is constituted of "everything which is essentially a Sign—not the mere body of the Sign . . . but . . . the Sign's Soul" (6.455).

Peirce replied to Lady Welby, on December 23, 1908: "As to the word 'play,' the first book of philosophy I ever read . . . was Schiller's *Aesthetische Briefe*, where he has so much to say about the Spiel-Trieb; and it made so much impression upon me as to have thoroughly soaked my notion of 'play' to this day" (Hardwick 1977:77). He toys with the captivating conceit of the "Play of Musement" in connection with an argument for the Reality of God (6.486; cf. MS 843), and variously associates this resplendent genitival phrase (repeated from 6.460) with Pure Play (which "bloweth where it listeth. It has no purpose, unless recreation . . .": 6.458), Meditation (6.458, 483, 487), and Reverie (6.458) ("Reverie-meditation being a species of *solitaire*" [MS 843]), then explains further: Musement "is a certain agreeable occupation of mind. . . . The particular occupation I mean . . . may take either the form of aesthetic contemplation, or that of distant castle-building (whether in Spain or within one's own moral training), or that of considering some wonder in one of the Universes, or some connection between two of the three, with speculation concerning its cause" (6.458). By "Universe" Peirce meant "a receptacle or class of Subjects" (6.455), and proceeded to identify three Universes as being familiar to us: "The first comprises all mere Ideas, those airy nothings to which the mind of the poet, pure mathematician, or another *might* give local habitation and a name within that mind" (6.455). The second Universe is "that of the Brute Actuality of things and facts" (*ibid.*). The third Universe is, as already noted, the semiotic one, which "comprises everything whose being consists in active power to establish connections between different objects, especially between objects in different Universes" (*ibid.*). The Sign's Soul, Peirce remarks, has in its power the capability of mediating between its Object and a Mind: "Such, too," he amplifies, drawing impartially upon artifacts of Nature and Culture, "is a living consciousness, and such the life, the power of growth, of a plant. Such is a living constitution—a daily newspaper, a great fortune, a social 'movement'" (*ibid.*). Peirce directs the Muser how to find universe-wide phenomena as they will strike his attention: "Let him, then, for example, after well considering, in all its breadth and all its depth, the unspeakable variety of each of the universes—even that of minds—turn his keen mental gaze to those phenomena that are of the nature of homogeneities of connectedness in each Universe in turn, and what a spectacle will unroll itself!" (MS 843; cf. 6.464). Speculations on the homogeneities of each Universe will naturally draw the Muser to the consideration of connections between two different Universes, or among all three. At last, "in the Pure Play of Musement the

idea of God's Reality will be sure sooner or later to be found an attractive fancy, which the Muser will develop in various ways. The more he ponders it, the more it will find response in every part of his mind, for its beauty, for its supplying an ideal of life, and for its thoroughly satisfactory explanation of his whole threefold environment" (6.465).

The only ordinance that applies to Pure Play is the law of liberty. Illustrations of this principle abound as much in physical science as in detectival ratiocination. Peirce notes (adducing here "The Murders in the Rue Morgue") that "problems that at first blush appear utterly insoluble"—anomalies, antinomies, perplexities, such as the quantum-mechanical paradox known as "observer-participancy," which imparts tangible reality to the cosmos (and which is the ultimate subject of Sebeok 1979: chap. 5 and chap. 8 of this book)—"receive, in that very circumstance . . . their smooth-fitting keys. This particularly adapts them to the Play of Musement" (6.640). In brief, the faculty of Musement—which Bronowski later, but more pallidly, chose to call *imagination*—"is the common root from which science and literature both spring and grow and flourish together" (1967:39). Bronowski used "image" as his coarse and unneeded synonym for Peirce's "sign," without regard for either its sensory quality or the wealth of distinctions Peirce drew among different species of signs (*ibid.*:34).

Peirce's Argument, in connection with which he brings the Play of Musement forward for consideration, can be loosely characterized as a "process of thought reasonably tending to produce a definite belief" (6.456). Accordingly, some of my readers may choose to skim through the following chapters with no higher expectation than may be required by Play—that is, by exercising their powers in as lively a fashion as they can work up while browsing. In stricter semiotic parlance, an Argument, for its Interpretant, is defined as "a Symbol, or Sign whose Object is a general Law or Type" (2.253). These essays can, therefore, also be registered more earnestly, in persual of the progression roughed out for anyone "determined to make trial of Musement as a favorite recreation. . . . It begins passively enough with drinking in the impression of some nook in one of the three Universes. But impression soon passes into attentive observation, observation into musing, musing into lively give and take of communion between self and self. If one's observations and reflections are allowed to specialize themselves too much, the Play will be converted into scientific study; and that cannot be pursued in odd half hours" (6.459).

It is the Play of Musement, then, that both animates and articulates the thirteen essays in this book. Their overall selfsameness was to be swathed by a seamless, if not always readily transparent, semiotic fabric whose strands are interwoven from filaments plucked from what I earlier identified as the major (i.e., biologically scrupulous) tradition of semiotic inquiry (Sebeok 1979:4ff.). But since Foreplay is the natural and legitimate prelude to semiotic (no less than somatic) arousal, I feel obliged

to mention that I regard these amalgamated texts—all of them written or rewritten in 1980—as the climactic topping off of a trilogy consisting, in addition to the aforementioned essays, of the eleven pieces included in my *Contributions to the Doctrine of Signs* (1976) and the nineteen featured in *The Sign & Its Masters* (1979). The pivotal motive pervading the Argument of this entire trilogy and interfused throughout all of these papers is my “absolute conviction that semiotics begins and ends with biology and that the sign science and the life science ineluctably imply each other” (Sebeok 1979:xiii; cf. Baer 1979 and Bouissac 1979, for inspired comments). John Greenleaf Whittier put the matter, in his characteristically homespun fashion, in the simplest of terms: “For nature speaks in symbols and in signs, / And through her pictures human fate divines . . .” (“To Charles Sumner,” 1854). This millennial metaphor of “the book of nature” goes back to the invention of writing and the influence that had on Mesopotamian divination. Of this convergence, Ginzburg (1980:13) justly remarks: “It gave the gods . . . the power of communication with their subjects through written messages—on stars, human bodies, everywhere—which the diviners had the task of deciphering” (cf. Sebeok 1976:28).

The virtuoso methodological device, or, if you will, semiotic ploy, into which Schiller's *Spieltrieb* ripened in Peirce's authoritative hands is far from being the only modern expression of the theme of the Play of Musement. Its most complex artistic realization is to be found in Hermann Hesse's multiply ambiguous utopian fantasy, *Das Glasperlenspiel* (1943), rendered but roughly as the “Glass-Bead-Game,” but usually referred to in English contexts by the Latin title of the hero, Joseph Knecht, as *Magister Ludi* (Hesse 1949). Hesse scholars commonly claim that Huizinga's famous (but, I fear, enormously overrated) *Homo Ludens* (1938; 1949) contributed to the novelist's concept of “play” as the highest manifestation of culture (Field 1970:153, 185-186n16). Yet it strains credulity to doubt Hesse's intimate familiarity with Schiller's *Letters*, and, as a corollary, to exaggerate his reliance on Huizinga, who demonstrably distorted Schiller's theory “in a way that is only explicable on the assumption that he can have read little more of the treatise than the single Letter [XIV] to which he actually refers” (Schiller 1967:clxxxvi). A perceptive passage in one of Thomas Mann's letters (cited by Field 1970:154), expressing his delight in the “sober playfulness” (*ernste Verspieltheit*) of Hesse's novel, itself contains an informed echo of a phrase made famous by Schiller. The *Ludi Magister* explicates the serenity of the so-called Castalian Order, in which is incorporated the faculty of the Bead Game: “With us it is the cult of truth closely bound up with the cult of the beautiful and, in addition to this, with the contemplative care of the spirit, and thus can never entirely lose its serenity; but our Bead Game unites within itself all three of these principles—science, reverence of the beautiful and meditation” (Hesse 1949:287). The point of Mann's remark was that, beyond this unifying principle that relates all knowledge

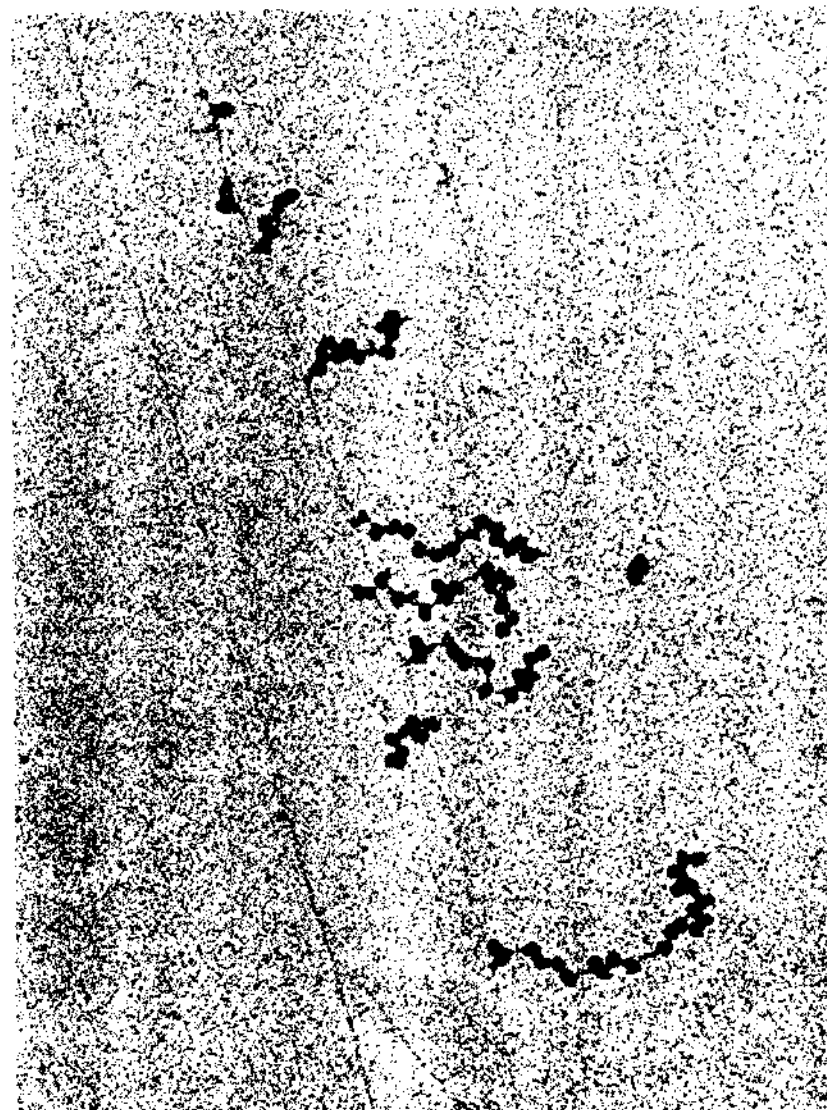


FIG. 1.1. The ultimate bead game: clusters of ribosomes, as revealed by the electron microscope. The ribosomes are connected in a series by a long nucleic acid molecule, which passes through each ribosome. The cluster resembles a gigantic assembly of beads on a string. Thus nucleic acid molecules serve both as part of the structure of the ribosome (the bead) and as the string that connects the beads. Illustration from O. L. Miller, et al., “Visualization of Bacterial Genes in Action,” *Science* 169 (24 July 1970):392-395, copyright 1970 by the American Association for the Advancement of Science. (See also Feinberg and Shapiro 1980:61f.)

to a central theme, Hesse's novel itself was a Bead Game, a "playing with all the contents and values of our culture" (Field 1970:154).

When the Game began, it had been a mere structure, an "arrangement, a grouping and opposing of concentrated performances from many fields of thought and from the beautiful. . . ." Gradually, however, "the concept of contemplation had entered the game . . . the greatest care was devoted to the art of . . . meditation. In this manner the hieroglyphics of the Game were prevented from degeneration into simple letters" (Hesse 1949:38). Later still, "This Game of games, under the hegemony of now this, now that, science or art, has developed into a kind of universal speech, through the medium of which the players are enabled to express values in ludic symbols and place them in relation to each other" (ibid.:39). The figures and formulas of the Bead Game are constructed in a metasemiotic—the "universal speech" of signs and symbols, of the riddling oracle game (*alla semainei*), indeed, of the nature of reality itself (e.g., ibid.:119)—"composed from all the arts and sciences and striving toward perfection, being pure and reality" (ibid.:40). The players called this accomplishment "realisation," being the path from the possible to the real.

For Peirce, man is a string of signs, a text (cf. Sebeok 1979:61f.); for Hesse, man is a traveler, an essay (1949:75). Hesse's Game is a cosmic ecumenical semiotic suffused by the incandescence of subjective intensity, a glow that some—Northrop Frye comes immediately to mind—would call the essence of romance. It is hardly surprising that the Master cautions young Joseph: ". . . everyone is not in favour of the Bead Game. They say" (and who among us has not heard this semioclastic censure before: "que la science sémiologique n' avait pas trop bien tourné: elle n'était, souvent qu'un murmure de travaux indifférent, dont chacun différenciail l'objet, le texte, le corps" [Barthes 1975:163]) "that it is a substitute for the arts, and that the players are belletrists who cannot be regarded as being actually inspired but only as artists of free fantasy and dilletantism" (ibid.:75). The Master then warns Joseph to prepare for conflict. His next words should be committed to memory by every apprentice semiotician:

One thing is certain: the Game is not without its dangers. . . . But you must never forget that what I have so often told you: our object is to discern opposites correctly, in considering them primarily as opposites but eventually as poles of a single unit. This applies also to the Bead Game. . . . You will get to know these antitheses, and will in time discern that they are not objective but subjective, and that, for example, an artistic dreamer does not avoid pure mathematics or logic because he has recognized and found it contradictory, but because his leanings are instinctively elsewhere. . . . Mark well: one can be a strict logician or grammarian and yet be full of fantasy and music. One can be a musician or a bead-player, and yet be devoted to law and order. The man whom we take to be our ideal and try to emulate should be able at all times to exchange his art or

science for any other, should allow the most crystal clear logic to radiate from his Bead Game and display the most creative fantasy in grammar. That is how we should be, and we should be prepared at any moment to be transferred to another post without opposition or allowing ourselves to become confused. [Ibid.:75-76]

The action in Hesse's utopian novel takes place in another century—around 2400 A.D.—as the sophistication of the Game approaches an ideal state of perfection under the superintendence of the Magister Ludi. We, the contemporary players, who are not yet prepared, hark back to diverse—even competing—traditions, varying in breadth of scope, flexibility in employment, and maturity as to conviction. For some, semiotic studies are nothing but child's play—no more than the discernment of "opposites correctly" (cf. Claus 1976). Such is the chilling conclusion I came to on a frigid Saturday afternoon in Toronto soon after I returned home from having acted as companion and guide to a young lady, who had just barely pushed past the age of four, at a tense viewing of *The Empire Strikes Back*. The precocious lass is a fervent admirer of Darth Vader's martial skills and stunning weaponry, although his wheezing metonymic malevolence and one breathtaking glimpse of his phallic *pars pro toto* head, caught in the act of sheathing, will cunningly continue to feed on her (and my) fancy as the rest of the epic unfolds and maybe beyond. (*The Empire Strikes Back* is not, as I had, in my innocence, assumed, Episode II of *Star Wars*, but Episode V, following hot upon what had retrospectively become Episode IV!)

The mythic overtones that encumber the second installment (i.e., Episode V) of the saga make it a prime candidate for the kind of global interpretation whose operative antithetical constituents—whether in the armature (Greimas 1970:187f.) or the code (ibid.:189-197) or the message (ibid.: 188f.) of its narrative structure, or overdetermined by a plurality of the aforementioned—are of such stupefying generality as to inspire deft parodic inventions, topped by Woody Allen's *Love and Death*.

In the course of a series of evening seminars conducted by my youthful escort, we chanced to hit upon the passport to the plot of *The Empire Strikes Back*. The film is, at bottom, we came to believe, a metacommunication about *communication* in its multiform galactic gradations ("le mythe lui-même . . . j'appellerai méta-langage, parce-qu'il est une seconde langue, dans laquelle on parle de la première" [Barthes 1957:222]). Since our dialogues and their tentative resolution may have some bearing on several themes recurring in this book and its two related predecessors, I thought I would pass on the substance of our deliberations in the hope of shedding some more light on the issues treated therein and for their inherent methodological import.

This story, as unfolded in this particular installment, is populated by five principal groups (Tessnière's *actants*) of creatures (*acteurs*), distinguished one from another in terms of the semiotic competence and

functions of each class. Toward the center is an assembly of more or less "normal" men and women, constituting Group II, who all speak fluent, if, by and large, tediously slangy, English. Linguists might call the speech level of Group II a "restricted code" (Bernstein 1974:1551ff.) or the low variety of diglossia (Ferguson 1971:3). As Bernstein emphasizes, this does not mean that speakers will at no time use other variants—the choice of dialect depends on the context. Here belong Han Solo, the Princess Leia Organa (the only vocal female in this film), Lando Calrissian, the Nazi officer types running Darth Vader's Star Ships, miscellaneous extras of the Rebel forces, the human but bizarrely amoral bounty hunters, and, at this stage of his personal development, Luke Skywalker: as the Dark Lord of the Sith, the antagonist, is a former Jedi Knight, the protagonist, young Luke, reciprocally, is a Jedi Knight in the making. Some Group II characters are Good (+), some Bad (-), or, like the master of the City of Clouds, some Dubious (\pm).

Above this ordinary medial group there looms a handful of Jedi Masters, members of Group I, each in his way a Magister Ludi, each presumably a male, but appearing to be a sexless neuter (one being a mere manikin, one but a shade, and one often heard but hardly ever seen, as it were, "in the buff"). The Masters are not merely alive; Yoda claims, "Luminous beings we are, not this crude matter." Two of them are Good; one is Evil (on the light side and the dark side of the unifying principle—known as the Force—respectively). You recognize Jedi Masters mainly by virtue of the fact that they often speak in an elaborated code (Bernstein 1974:1551ff.), or the high variety in diglossia (Ferguson 1971:3); in other words, they cultivate the mannerisms of some characters out of *The Lord of the Rings*. The homunculus Yoda, the most venerable of the Masters (Yoda trained Ben, who trained Vader; both Ben and Yoda are training Luke, and Vader would like to), is only two feet tall, but over 800 years old, mutedly Oriental, and, as befits a gnome, given to gnomic utterances. (Luke: "I don't believe it." Yoda: "That is why you fail." Yoda also tends to talk, in *Timestyle*, "backwards": "No good is this . . . what know you of ready? . . . Tried have you? Always with you it can't be done. Hear you nothing that I say? . . . Try not. *Do, do*. Or do not. There is no try.") Yoda also has a soulful and expressive gaze, notably long, mobile ears, movements of which, baton-like, punctuate his verbal apothegms. The spectral Ben (Obi-Wan) Kenobi, as enacted by Guinness, cannot help sounding like Sir Alec. The utterances of the Lord Vader are, of course, doubly marked: + heavy-breathing, to denote controlled malevolence; and + grandiloquence, to signify his social status, which is, well, imperious. Luke, advised by Ben to "unlearn" what he has learned, is edging toward the Upper Class, and this upward mobility is occasionally reflected by his verbal, though more often by his heroic non-verbal, behavior; at any rate, it shifts in that direction as the plot develops. The nefarious Darth Vader may even be the exemplary Luke's real father, but we cannot be sure as yet how the present myth will

finally articulate either with Oedipus (although its Sophoclean associations are obvious) or with Percival (although its Wagnerian resonances cannot be overlooked either). (Cf. Sebeok 1979:177.)

Sharply demarcated from the two Upper Classes, both endowed with innate verbal propensity, one high, the other low, is Group III, the members of which are called Wookiees, most prominently embodied (personified?) by Chewbacca. The Wookiees are speechless creatures, but these brutes do grumble, gurgle, grunt, bark, and howl a lot, can communicate with ease by a verbal means, and seem to possess a moderate degree of intelligence as well as an impressive budget of irrational loyalty. Wookiees can be taught splendid technical skills, such as co-piloting at least some primitive sorts of spacecraft. They remind one, in short, of the Smart Simians discussed in chapter 8 of this book (I was especially struck by the resemblance at the moment when the Princess Leia rejects her human suitor, Han, with the immortal refusal, "I'd just as soon kiss a Wookiee"—more than a hint, surely, of the miscegenetic Beauty and the Beast motif).

Wookiees are alive but necessarily speechless. The robots, or droids, of Group IV, on the other hand, are biologically inert computers that, nonetheless, can be programmed to communicate with the world of the living, as well as with each other, in several alternative ways. The surgeon-droid, 2-1B, for example, speaks, in an authoritative manner, a high-prestige technical idiolect, interlaced with medical cant: "Commander Skywalker has been in dormo-shock but is responding well to the bacta." The anthropomorphic C-3PO also converses by means of a natural language (English), supplementing his vocal commerce by a stiff mimicry of human gestures. Both droids have synthesized voices. But C-3PO has been overeducated: this droid is so excessively loquacious that it has to be disengaged at critical moments (Han Solo: "Either shut up or shut down"). Too, its speech sounds elaborately genteel—to American ears, insufferably like comical-British.

By contrast, R2-D2 interfaces with humans by means of a kind of Yerkish, consisting, in the acoustic channel, of beeps and especially whistles, which, accompanied by expressive visual displays, act as a speech surrogate (Sebeok 1976: chap. 11). The transmutation of the squat droid's messages is accomplished with the aid of miniature computers; Luke's X-wing fighter, for instance, carries an attachment capable of transcoding them onto a control panel view screen in English sentences.

C-3PO tries to rise, unsuccessfully, up the semiotic ladder and is punished for this transgression—is, in fact, temporarily junked altogether on the planet Bespin. R2-D2 is content to stay a mechanical but superior conversant droid and is continuously rewarded, like a pet dog, with affection.

Group V consists of an olio of men, monsters, and machines whose common property is that all of them approach semiosis degree zero. They are, because of this handicap, ineffably sinister and malefic. Here belong

Vader's Hitlerian storm troopers, who can receive verbal orders but carry them out in disciplined silence. Like a superorganism of army ants, they lack individual traits: these soldiers seem like an aggregation of cellular units whose component parts seldom even try to exchange messages averbally. In these respects, these animate soldiers are no different from the inanimate, insectiform Probe Droids, which are endowed with, among other such appendages, a set of auditory sensors.

The Wookiees are not to be confused with the speechless domesticated chimera—the Tauntaun, or growling snow-lizards, being ridden over the frozen landscapes of Hoth in the opening scene—or with the sporadic monsters (the dreadful Wampa Ice Creatures, the squishing Mynocks, the swinish Ugnaughts, or the titanic Space Slug) befouling the galaxy. These feral outer-space predators are mostly vermin that would rather consume than reason with you.

To summarize: The members of Groups I-III are all animate. The linguistic competence of Group I is elaborated, of Group II restricted, and of Group III nonexistent. The members of Group IV are all inanimate. They may be general- or special-purpose computers, programmed, accordingly, to produce a suitable level of synthetic speech. Others may be programmed to produce a speech surrogate, which has to be encoded and decoded by appropriate peripheral devices. The members of Group V, whether organic or inorganic, perform semiotic displays minimally, if at all.

This analysis does not begin, nor was it meant, to exhaust the deep structure of *The Empire Strikes Back*. For one thing, it hardly touches on the film's multifaceted, pregnant intertextuality. Sophocles, Wagner, Tolkien, and the Muppets (Frank Oz was the creator and the voice of Yoda) have already been alluded to; many other films could be mentioned, notably *The Wizard of Oz*, any number of World War II movies, with maybe a touch of Charlie Chan flicks. More important, we are, by definition, dealing with an *open* product, in Eco's sense, not merely "on account of its susceptibility to countless different interpretations" (Eco 1979:49), but quite literally, because of the text's interdependence with *Star Wars* as well as with perhaps as many as seven other installments yet to be produced, some to take place before, others after, the action allotted to this specific segment; truly, this is a situation in flux, a "work in progress" (ibid.:65). So we are left, provisionally, with an open narrative sequence, the elementary structure of which is quite transparent. Its binary semic organization can, as well, be displayed in sets of homologous four-term oppositions and contradictions, the outcome of each of which is a logical rectangle, or a scheme Greimas calls a semiotic square (*carré sémiotique* or, sometimes, *modèle constitutionnel*) (e.g., 1970:135-155, 157-183), and Segre condemns as "a redundant tool" (1979:51), but the underlying representation of which goes back to at least Roman rhetorical practice. This paradigmatic structure of signification is always laid out in terms of two polarized semes, in which each character set is

assigned a thematic label, and the other set is assigned the opposite of that label. The plot of the narration involves the superimposition of time over the paradigmatic conflict, and this syntagmatic narrative transformation ("stretching out") comes to its eventual climax with an inversion of the initial configuration of the groupings of the *dramatis personae*.

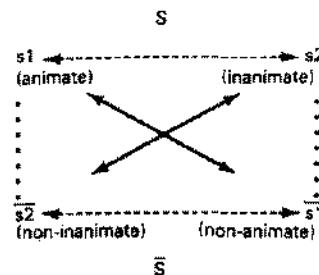


FIG. 1.2. S = Zoetic

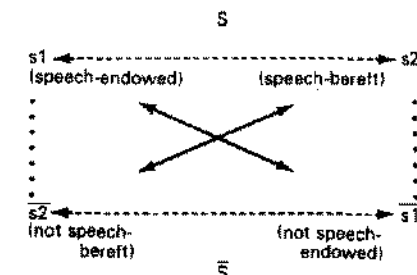


FIG. 1.3. S = Semiotic.

The attentive reader should now be able to generate a complete universe of meaning, starting from any point in either Fig. 1.2 or Fig. 1.3 (or several other squares that could readily be constructed). With a little bit of ingenuity, and by unleashing the Pure Play of Musement, the spawning of endless movie scripts for further sequels and prolegomena to *Star Wars* should also be a romp.

Once before in this Introduction, the twin locutions "microcosmos" and "macrocosmos" have cropped up, but, as Heraclitus already well knew, there is a structural isomorphism between the inner personal world of the psyche and the vaster natural order of the universe. This central insight was summed up in his aphorism xxviii: "I went in search of myself." A paradox of this sort belongs with Kant's antinomies about space, time, and causality. What Heraclitus meant was that once he encountered the law of the microcosmos within himself, he discovered it anew in the external world (cf. Diels 1901:vii). Heraclitus supplies—if in fragmentary fashion—the essential link between the biosphere and the semiosphere, which is perfectly condensed by Thom's translation of the Heraclitean logos as "form"; and recall that it was the late Barthes who affirmed that "La sémiologie est une science des formes . . ." (Barthes 1957:218). We know that Heraclitus juggled with logos in at least four of its senses all at once: he intended by the term (1) his own discourse, (2) the nature of semiotic systems in general, (3) the composition of mind, and (4) the universal principle in accordance with which all things come to pass. Thom is absolutely correct, therefore, in interpreting *logos* as "the formal structure that assures for any object its unity and its stability" (Thom 1975:329n5; cf. Sebeok 1979:289n6). And Heraclitus thus marks the beginning of Hesse's unification of opposites in the Game: "It is wise, listening not to me but to the report [*logos*], to agree [*homologein*] that all things are one" (aphorism xxxvi). The reconciled antithesis be-

tween the themes of isolation and the community of *logos* is then triply applied to the Universes that Peirce alluded to, which, in Heraclitus, appear as (a) the semiotic production, (b) the private personality (mind), and (c) the communal domain. By its rational structure and its public function of the art and thought of Heraclitus, "language becomes a symbol for the unifying structure of the world which wisdom apprehends" (Kahn 1979:131). The superformula $E = mc^2$, which expresses the unifying structure of the world—the relationship of mass to energy—is intimated in the dedication of this book.

In chapter 2 we show that Peirce's uses of the Play of Musement bear a more than casual resemblance to Sherlock Holmes's advocacy of imagination (the specifically human faculty "to make images and to move them about inside one's head in new arrangements" [Bronowski 1967:39]), intuition and speculation (cf. Peirce 5.213n1), or extreme languor. Ginzburg (1980:12) independently reaches the same conclusion that we did, recognizing the emergence, toward the end of the nineteenth century, of a semiotic paradigm based on the interpretation of symptoms, features, clues, in a word, *indices*, and shows how this model, rooted in medical semiotics, became influential throughout the human sciences at large. Its transfiguration can be traced from primitive hunting cultures and, quite specifically, Mesopotamian divinatory doctrine, to the modern sciences, and, moreover, this progression from the mantic to the rational can be understood best in terms of semiotic principles, systematically applied (Bottéro 1974).

In chapter 4 I deal with the artist, romancer, and necromancer Morris, who himself could well have qualified for membership in the Castalian order: with this serene encyclopedist, who endeavored to dovetail all the scientific disciplines, "the cult of truth [was] closely bound up with the cult of the beautiful and, in addition to this, with the contemplative care of the spirit. . . ." And in chapter 5, I turn to Bühler, under Meinong's sway, who wrote so eloquently about the role of play (*Spielräume*) in the vernacular, in the language of the poet (often in heightened fashion), as well as in the language of scientific works (Bühler 1965:171f.).

I return to a consideration of *Spieltrieb*, in somewhat more detail, in chapter 9, citing Spencer as having propagated, in 1897, the union of the play-impulse with aesthetic feelings and sentiments—a point of view widely advanced among contemporary biologists to account for and define art. I neglected to add that, churlishly, Spencer refuses to acknowledge by name the source of his argument, which was, unmistakably, Schiller.

In short, the contents of this book were shaped to exemplify the Play of Musement as a species of reverie on the threshold of scientific study. Its end is to meditate upon connections among the Universe of Signs and other Universes, to provoke, and to speculate—tempered by critical discussion—concerning the causes for such associations. The essays focus on the wellsprings and vital foundations of several major types of semiosis:

1. In the averbal domain, on architecture, dance, music, painting, and behavior generally (chap. 9, Appendix I).

2. In the verbal domain, on an (to me, autobiographically consequential) aspect of the verbal art (chap. 3), and—rather extensively—the alleged bent of several species of animals toward language (chaps. 6, 7, 8, Appendix II). We also discuss certain crucial problems in logic, notably abduction (chap. 2), both in fact and in fiction.

3. Self-referentially, I take up the dialectic of semiotic inquiry itself, particularly as exemplified by Peirce (chap. 2), Morris (chap. 4), and Bühler (chap. 5).

4. Finally, in one essay (chap. 10; cf. Appendix III) I attempt to trace out links between two seemingly very different Universes: the intimately coupled worlds of the mind and of the brute neurochemical blob enclosed in and radiating from the human cranium. Among other enigmatic oppositions I try to conjecture about in this work, none remains more profoundly puzzling and unresolved. Schrödinger, Wigner, and Popper and Eccles have all expressed the view that "there is need for some revision of physics in order to allow for the interaction of mind and matter in some special regions of the brain" (Eccles 1979:4). Monod, on the other hand, pejoratively labeled those who hold a belief in "dualist interactionism" as animists. My personal biases strongly incite me to adopt—to be sure, provisionally—a variant of the dualist-interactionist hypothesis, one which is closest to a theory maintained by J. Z. Young. This theory involves the principle of double coding and control. Quite briefly, according to this model (substituting my terminology), the mind is a system of signs—hence an immaterial order that upholds order. The mind is "the manifestation of the information coded within our physical brains" (Young 1979:45). Signs, although they are never material, can only be actualized and carried by material systems, whether static or dynamic. Signs pervade all of life (Sebeok 1977c) "as the encoded information that directs those ordered activities so that life continues" (Young 1979:45).

At present we know virtually nothing about the manner in which information is coded and controlled in brain operation, but Young's way of looking at the problem pinpoints at least the right questions to ask, which are, essentially, semiotic in character. His view implies that although mind and body are in a sense distinct, they can never be separated. I totally concur with his conclusion that, instead of postulating a distinct body and mind, "we can usefully consider that life is an activity that continues because it is directed by the symbolic non-material information about order, as embodied first in DNA and then in brains" (ibid.: 54). It will not have escaped the reader's attention that Young's model is itself derived from comparison with the coding operation semioticians employ when dealing with human communication.

In conclusion, I should like to return to the Magister Ludi's haunting admonition to Joseph: "the Game is not without its dangers. . . ." An

especially perilous area of application is that of confidence games, which are very ancient but are, today, enhanced—and, by the same token, veiled—by the tools of modern technology. It is fascinating to learn from Maurer's classic book that competent con-men find a good deal of diversion in "playing the con" (Maurer 1974:89), presumably for the sake of Pure Play, as it were, besides the more tangible rewards of their kind of work. At the end of a con game, after the sting, it is of the essence to cool the mark out—that is, to pacify the victim after the fleecing, to stop him from complaining ("beefing") to the authorities.

When a con game is exposed, the informer is in double jeopardy: on the one hand, from the con mob itself (*ibid.*: chap. 5 and p.273); but even more so from Mr. John Bates, as the mark is commonly named in the big-con lingo. When he finally is convinced that he has been swindled, he is often "incapable of speech. He is sickened by what he has been through" (*ibid.*:69). Yet the hatred the addict nurses is seldom directed at the insideman (*ibid.*:279f.). As Northumberland tells Morton, ". . . the first bringer of unwelcome news/ Hath but a losing office; and his tongue/ Sounds ever after as a sullen bell,/ Remember'd knolling a departing friend."

Certain facets of the story of the Clever Hans Phenomenon—the effect and the fallacy (which are by no means synonymous)—are examined in several chapters of this book. Hans, the eponymous stallion, died early in the century. Or did he? He seems, rather, to have become a shape-shifting revenant, a ghost animal returning to complete his unfinished business of *épater le bourgeois*. A notable attribute of revenants is that, like poltergeists, they make noise: "they groan, cry, scream, yell, moan, wail, howl, holler, and sigh; they curse, laugh, whoop, whisper, cough" (Jones 1950:934)—or they simply paw the ground, or, aping the deaf, they "sign." Hans, indulging in such distasteful semiotic comportment, sometimes reappears as another horse, as a pig or a dog, more recently as a porpoise or a primate, or, in more modest guise, a tortoise or a woodpecker. Many educated people are quick to believe in the "accomplishments" of the avatars of Hans, especially when their faith is reinforced by the media—particularly popular television—acting as accomplices, or shills, for the act (Sebeok 1979:282n4). (For example, the opening segment of *Those Amazing Animals*, on WRTV-ABC Indianapolis, aired on August 24, 1980, featured a miniature mare, Kristina, that solves math problems, just as Morocco did in the seventeenth century. Kristina, like Lady and Weeping Roger [Sebeok 1979:90, 28n3] before her, was billed as "a mind-reading horse with ESP," although she was reacting to the most blatant gestural signs imaginable. I should perhaps add that this show is a spin-off from an earlier one, aptly titled *That's Incredible*.)

Our really very humble analysis of the Clever Hans Phenomenon and its all too easily recognized exploitation in current investigations of the alleged linguistic capacity of chimpanzees and gorillas has taught me how hazardous an undertaking it is to attempt to play the Game in

straightforward fashion: we aimed our studies at scholars who dared face the facts as they are, rather than as they would wish them to be; at responsible, not avid, journalists; and at laymen who prefer the path of sanity to that of credulity. The greasy alarums and excursions—although their noisomeness was, fortunately, enlivened by farcical overtones—that ensued upon the heels of our early publications on this subject cannot be summarized here. I am saving this chronicle for another book, now in the making, to be devoted entirely to the saga of Clever Hans, his antecedents and his followers in its full implications for human affairs, including the murky corners of academic fraud and the far more commonplace intricacies of scientific self-deception.

Let me merely call attention here to one beacon shining through the miasma of contention about this phenomenon that, for me, unexpectedly clarified a host of previously mystifying attitudes in respect to the facts of the matter and the lines of argumentation used by our adversaries. In a recent notice of our book, *Speaking of Apes* (1980a), the sociologist Truzzi independently confirmed this flash of insight: "The arguments found in this [area of research] sharply parallel those between critics and advocates in psi research." *Psi research* is a cover term for telepathy ("mind reading"), clairvoyance ("second sight"), precognition ("divination"), and psychokinesis (e.g., "levitation"). All four have long been part and parcel of folklore and superstition; none of them, in a century of unrelenting research, has ever enjoyed empirical verification (Hansel 1980; Marks and Kammann 1980). However, the advocates of psi research have developed a set of standard rules obtaining to their dialectical wonderland. This means that if you want to engage with them in argumentation, you must abide by the assumptions of the logic they constructed for their world's benefit. What is utterly amazing is that the ape "language" investigators and those engaged in comparable explorations with other animals have adopted psi logic. This astounding tendency—which has, since May 1980, been widely perceived—has certain highly interesting consequences that I also intend to examine in my next book. For the time being, and with deep apologies to Eliot, I am forced to close this issue:

I have seen the primates signing, each to each.
I do not think that they will sign to me.

For a writer of my temperament and my predilections, one of the greatest gratifications in assembling the materials for different portions of a book of this kind derives from the now this, now that coterie of people—experts and charlatans, scholars and conjurers, academics and circus folk, observers and fanatics—with whom one has the privilege of intermingling over weeks or months at a time. Many friendships are forged, many enmities begotten, both to be savored for a lifetime. What other profession would simultaneously impel one to plunge into the

interlocked brotherhood of the Baker Street Irregulars of New York, the Napoleons of Crime of Detroit, the Red Circle of Washington, and the Sherlock Holmes Society of London, with one compartment of one's mind, and, with another, to become ensnarled in the festering twilight zone inhabited by enslaved Wookiee-like chimeras out of *The Island of Dr. Moreau* and those exercising supercilious mentorship over their fate? Always with benevolence, though often backed up by electric cattle prods, endowed with ample public and private funding, these men, women, and couples, in deadly competition with one another for their share of attention and resources, constitute a formidable phalanx of specimens of a sort I have previously encountered only at such fringes of the Universe of learning as celebrations of ESP and orgies of ufology, or among students of the Bermuda Triangle, Big Foot, and the Loch Ness Monster. These are all great stories, and I relish their exoticism as long as these childish amusements are not mistaken for the extremely unlikely. The Play of Musement has, so far, led me to excitingly novel encounters at the borderline of biology and semiotics, in frequently surprising, sometimes relishingly controversial, but most often unfamiliar meeting places in the Universe of contemporary experience.

Chapter 2

"You Know My Method": A Juxtaposition of Charles S. Peirce and Sherlock Holmes

"I never guess."

—Sherlock Holmes
in *The Sign of Four*

But we must conquer the truth by
guessing, or not at all.

—Charles S. Peirce, Ms. 692

INTRODUCTORY NOTE

WHO IS THE most original and the most versatile intellect that the Americas have so far produced? The answer "Charles S. Peirce" is uncontested, because any second would be so far behind as not to be worth nominating. Mathematician, astronomer, chemist, geodesist, surveyor, cartographer, metrologist, spectroscopist, engineer, inventor; psychologist, philologist, lexicographer, historian of science, mathematical economist, lifelong student of medicine; book reviewer, dramatist, actor, short story writer; phenomenologist, semiotician, logician, rhetorician, metaphysician—and, the Sebeoks now add, detective! He was, for a few examples, the first modern experimental psychologist in the Americas, the first metrologist to use a wave-length of light as a unit of measure, the inventor of the quincuncial projection of the sphere, the first known conceiver of the design and theory of an electric switching-circuit computer, and the founder of "the economy of research." He is the only system-building philosopher in the Americas who has been both competent and productive in logic, in mathematics, and in a wide range of the sciences. If he has had any equals in that respect in the entire history of philosophy, they do not number more than two.

The materials constituting this chapter, written in collaboration with Jean Umiker-Sebeok, originally appeared in *Semiotica* 26:203-50 (1979). They were subsequently incorporated into a monograph, rearranged, enhanced by additional illustrations, and graced with the illuminating introductory note by Max H. Fisch. This hardback edition was undertaken at the invitation of Jack Tracy, and appeared in his series, Gaslight Publications (Bloomington, Indiana, 1980). Arrangements have, so far, been completed for the publication of a Japanese version, and are currently in progress for German, Italian, and Portuguese versions as well.

Peirce (pronounced *Purse*) was born in Cambridge, Massachusetts, in 1839. His father was professor of mathematics and astronomy at Harvard College. Charles thus grew up in the Cambridge scientific circle. He took his bachelor's degree at Harvard in 1859, and a graduate degree in chemistry *summa cum laude* at the Lawrence Scientific School in 1863. His longest employments were (1) as a research scientist in the Coast and Geodetic Survey, 1859-60, 1861-91, and, in conjunction therewith, as observer in the Harvard College Observatory, 1867-75; (2) as reviewer, primarily of philosophic, scientific, and mathematical books, for *The Nation*, 1869-1908 (along with the *New York Evening Post*, 1890-1908); and (3) as Lecturer in Logic at The Johns Hopkins University, 1879-84. He gave courses of lectures at Harvard University in 1865, 1869-70, 1903, and 1907, and at the Lowell Institute in Boston in 1866, 1892-93, and 1903; a course of "Cambridge Conferences" in 1898; and occasional lectures in other places. He was a principal contributor to *The Century Dictionary*, in six volumes, 1889-91, and to Baldwin's *Dictionary of Philosophy and Psychology*, in two volumes, 1901-2. He was elected a Fellow of the American Academy of Arts and Sciences in 1867, a member of the National Academy of Sciences in 1877, and a member of the London Mathematical Society in 1880. His service in the Coast and Geodetic Survey involved five periods of transatlantic duty adding up to nearly three out of the thirteen years 1870-83. He represented the United States at meetings of the International Geodetic Association and thereby became the first American delegate to any international scientific association. Well over a hundred Ph.D. theses, thirty books, and a thousand articles and chapters have been written concerning various aspects of his work.

The most extensive editions of his writings are (1) the eight volumes of *Collected Papers* (Harvard University Press), Vols. 1-6 edited by Charles Hartshorne and Paul Weiss, 1931-35, and Vols. 7-8 by Arthur W. Burks, 1958 (commonly cited by volume and paragraph number); (2) the four-volumes-in-five of *The New Elements of Mathematics* (Mouton) edited by Carolyn Eisele, 1976; and (3) the three volumes of *Contributions to "The Nation"* (Texas Tech Press, Lubbock) edited by Kenneth L. Ketner and James E. Cook, 1975-79. The largest deposit of Peirce's manuscripts and correspondence is in The Houghton Library of Harvard University; see Richard S. Robin's *Annotated Catalogue of the Papers of Charles S. Peirce* (University of Massachusetts Press, 1967) and "The Peirce Papers: A Supplementary Catalogue" (*Transactions of The Charles S. Peirce Society* 7:37-57, 1971). A Microfilm Edition of the greater part of these papers is available from the Harvard University Library Photoduplication Department. There is also a nearly complete Microfiche Edition of the writings that Peirce himself published, accompanied by a printed *Bibliography*, both primary and secondary (Institute for Studies in Pragmaticism, Texas Tech University, Lubbock), edited by Ketner and others, 1977. A new printed selection from Peirce's writings, published and unpublished, in a single chronological order, in fifteen volumes, will begin appearing in 1981 from Indiana University Press. Volume I

will cover the years 1857-66, and most of its contents will be appearing in print for the first time.

The episode in Peirce's life which moved the authors of "You Know My Method" to compare him with Sherlock Holmes took place a century ago, in 1879, in the service of the Coast and Geodetic Survey. That was one of his most productive years. Two brief examples: (1) His "Note on the Theory of the Economy of Research," which opened a new branch of economics, appeared in the Survey's annual report for 1876, which came out in 1879. (2) "A Quincuncial Projection of the Sphere" appeared in the *American Journal of Mathematics*. (During the Second World War, the Survey published a new and much enlarged edition of the map, under the title "Peirce's World-Quincuncial Projection," as being the best on which to chart international air routes. And in 1963 the Survey launched a research vessel named for him, which is now in the service of the National Oceanic and Atmospheric Administration.)

Peirce had been initiated in methods of detection twelve years earlier, in the spring of 1867, by his father, Benjamin Peirce, the leading mathematician of the day, who had recently become Superintendent of the Coast Survey. The occasion was the Sylvia Ann Howland will case. This was one of the most famous cases that ever came to trial, and the most famous of the many famous things about it was the testimony of the Peirces. The questions at issue were (1) whether Miss Howland's signatures to the two copies of the "second page" codicil of an earlier will were genuine, or were forged by tracing her signature to the will itself, and (2) whether, supposing them genuine, the codicil invalidated a later will much less favorable to her niece, Hetty H. Robinson. The Peirces addressed themselves to the first of these questions. Under his father's direction, Charles examined photographic enlargements of forty-two genuine signatures for coincidences of position in their thirty downstrokes. In 25,830 different comparisons of downstrokes, he found 5,325 coincidences, so that the relative frequency of coincidence was less than a fifth. Applying the theory of probabilities, his father calculated that a coincidence of genuine signatures as complete as that between the signatures to the codicil, or between either of them and that to the will in question, would occur only once in five-to-the-thirtieth-power times. The judge was not prepared to base his decision on the theory of probabilities, but he decided against Miss Robinson on the second issue. (Nevertheless, she married Edward H. Green later in 1867 and, as Hetty Green, was on her way to becoming "the witch of Wall Street.") In a long article on "The Howland Will Case" in the *American Law Review* (July 1870), it was said that: "Hereafter, the curious stories of Poe will be thought the paltriest imitations."

Among the surviving Peirce manuscripts, the earliest account of the 1879 episode that he intended for publication was in a 1904 draft of a paper "On the Simplest Possible Branch of Mathematics." Other parts of that paper appeared for the first time in 1976, in *The New Elements of Mathematics*, Vol. I, pp.158-69.

Much the fullest account, and the only one so far published, was in an essay entitled "Guessing," which he wrote in the spring of 1907, twenty-eight years after the episode. It was first published in the short-lived magazine *Hound and Horn* in 1929, fifteen years after Peirce's death and fifty after the event. (Other parts of that essay were reprinted in *Collected Papers* 736-48 in 1958, but that central part was omitted except for brief mention in an editorial footnote.)

Very few Peirce scholars have gone back to the *Hound and Horn*. So it has remained for the authors of *You Know My Method*, a century after the episode, to take us back to "Guessing," and thereby to introduce Holmes buffs to a great philosopher, and at the same time to equip Peirce buffs to read his other writings with fresh eyes.

The extreme diversification of Peirce's work had a focus and a purpose. The focus was in logic, conceived at first as a branch of a branch of semiotics, but eventually as nearly coextensive with it, though with a distribution of emphasis different from those of semioticians who are not logicians. The purpose was to distinguish the possible kinds of semioses or sign-functions, and, among them, to make the most thorough study he could of arguments in particular, and above all of their functions in mathematics and in the sciences. His major single discovery was that what he at first called *hypothesis* and later *abduction* or *retroduction* is a distinct kind of argument, different both from deduction and from induction, and indispensable both in mathematics and in the sciences. This discovery came at least as early as 1866, and one of the chief interests of Volume I of the new edition will be in the steps that led him to it.

Whatever the technical name and definition of this third kind of argument should be, and the exact working out of its relations with the other two, an essential element of it is something for which the colloquial name is *guessing*. Comparing the historical Peirce and the fictional Sherlock Holmes as detectives and as elaborators of the theory of detection is therefore not just an entertaining diversion for Holmes buffs, but the best possible entry into Peirce's philosophy for readers not yet acquainted with it.

For the most part, even those who are acquainted with Peirce's work know only detached fragments of it. A philosopher, for example, is most likely to know of him as the founder of pragmatism, and a semiotician as the founder (or one of the two or three founders) of present-day semiotics. But neither the philosophers nor the semioticians seem aware that his pragmatism was a theorem of semiotics, and that much of his labor on semiotics was for the sake of perfecting his proof of that theorem. Perhaps the most lucid exposition of the argument was the one he composed in the spring of 1907, in the form of a long untitled Letter to the Editor of *The Nation*. "Guessing" was an offshoot of that letter which could not be reduced to its scale. About the time the letter was finished, Peirce heard that Bliss Perry, the editor of the *Atlantic Monthly*, was interested, and he sent him both the letter and "Guessing." Neither was accepted. By the time Peirce got them back and sent the letter to *The*

Nation, Paul Elmer More had succeeded Wendell Phillips Garrison as editor. The letter never appeared, and, so far as we know, it was never returned to its author. But three hundred and fifty pages of drafts survive in Manuscript 318, and the editors of the *Collected Papers* spliced two drafts just before the last sentence of CP 5.481 to form what they called "A Survey of Pragmaticism" (CP 5.464-96). The best parts of Manuscript 318 remain unpublished, and though perhaps most readers get some sense of the relation between the semiotics and the pragmatism, they get none of the relation between either of them and the role of "Guessing" in detection. So the fragmentation continues.

Where, then, should a beginner begin? With "You Know My Method," I suggest, followed by CP 7.36-48 for most of the rest of "Guessing"; for, as the Sebeoks' Peircean epigraph puts it: "We must conquer the truth by guessing, or not at all."—MAX H. FISCH

C. S. PEIRCE—CONSULTING DETECTIVE

On Friday, June 20, 1879, Charles S. Peirce boarded the Fall River Line steamship *Bristol* in Boston, bound for New York, where he was to attend a conference the next day. Upon his arrival in New York, the following morning, he experienced what he describes as a "strange fuzzy sensation" in his head, which he attributed to the stale air of his stateroom. He hurriedly dressed and left the ship. In his haste to get some fresh air, he inadvertently left behind his overcoat and an expensive Tiffany lever watch which had been purchased for him by the U.S. government for his work with the Coast Survey. Soon realizing his oversight, Peirce rushed back to the boat only to find his things gone, at which point, faced with what he felt would be a "life-long professional disgrace" were he not able to restore the watch in as perfect condition as he had received it, he tells us that, having "then made all the colored waiters, no matter on what deck they belonged, come and stand up in a row. . . ."

I went from one end of the row to the other, and talked a little to each one, in as *déagé* a manner as I could, about whatever he could talk about with interest, but would least expect me to bring forward, hoping that I might seem such a fool that I should be able to detect some symptom of his being the thief. When I had gone through the row I turned and walked from them, though not away, and said to myself, "Not the least scintilla of light have I got to go upon." But thereupon my other self (for our communings are always in dialogues), said to me, "But you simply *must* put your finger on the man. No matter if you have no reason, you must say whom you will think to be the thief." I made a little loop in my walk, which had not taken a minute, and as I turned toward them, all shadow of doubt had vanished. There was no self-criticism. All that was out of place. [Peirce 1929:271]

Taking the suspect aside, Peirce was unable to persuade him, either through reason, threat, or promise of fifty dollars, to return his belongings to him. He then "ran down to the dock and was driven as fast as the

cabby could, to Pinkerton's." He was taken to see a Mr. Bangs, the head of the New York branch of that famous detective agency, and reports the following interview:

"Mr. Bangs, a negro on the Fall River boat, whose name is so-and-so (I gave it) has stolen my watch, chain, and light overcoat. The watch is a Charles Frodsham and here is its number. He will come off the boat at one o'clock, and will immediately go to pawn the watch, for which he will get fifty dollars. I wish you to have him shadowed, and as soon as he has the pawn ticket, let him be arrested." Said Mr. Bangs, "What makes you think he has stolen your watch?" "Why," said I, "I have no reason whatever for thinking so; but I am entirely confident that it is so. Now if he should not go to a pawn shop to get rid of the watch, as I am sure he will, that would end the matter, and you need take no step. But I know he will. I have given you the number of the watch, and here is my card. You will be quite safe to arrest him." [1929:273]

A Pinkerton man was assigned to his case, but instructed to "act upon his own inferences" rather than follow Peirce's surmises about who the culprit was. The detective, looking into the personal background of each Fall River waiter, began shadowing a man other than Peirce's suspect, and this proved to be a false lead.

When the detective thus came to a dead end in his investigation, Peirce returned to Mr. Bangs, and was advised by him to send postcards to all the pawnbrokers of Fall River, New York, and Boston, offering a reward for the recovery of his watch. The postcards were mailed out on June 23. The next day, Peirce and his Pinkerton agent recovered the watch from a New York lawyer, who directed them to the pawnbroker who had responded to his offer of a reward. The pawnbroker himself "described the person who pawned the watch so graphically that no doubt was possible that it had been 'my [i.e., Peirce's] man'" (1929:275).

Peirce and the detective then made their way to the suspect's lodgings, with the intention of also recovering the missing chain and overcoat. The detective was reluctant to enter the premises without a warrant, so Peirce, disgusted by the agent's ineptitude, went in alone, confidently telling the agent that he would return in exactly twelve minutes with his property. He then described the following sequence of events:

I mounted the three flights and knocked at the door of the flat. A yellow woman came; but another of about the same complexion was just behind her, without a hat. I walked in and said, "Your husband is now on his road to Sing Sing for stealing my watch. I learned that my chain and overcoat which he also stole are here and I am going to take them." Thereupon the two women raised a tremendous hullabaloo and threatened to send instantly for the police. I do not remember exactly what I said, I only know that I was entirely cool and told them they were quite mistaken in thinking that they would send for the police, since it would only make

matters worse for the man. For since I knew just where my watch and overcoat were, I should have them before the police arrived. . . . I saw no place in that room where the chain was likely to be, and walked through into another room. Little furniture was there beyond a double bed and a wooden trunk on the further side of the bed. I said, "Now my chain is at the bottom of that trunk under the clothes; and I am going to take it. . . ." I knelt down and fortunately found the trunk unlocked. Having thrown out all the clothes . . . I came upon . . . my chain. I at once attached it to my watch, and in doing so noticed that the second woman (who had worn no hat) had disappeared, notwithstanding the intense interest she had taken in my first proceedings. "Now," said I, "it only remains to find my light overcoat." . . . The woman spread her arms right and left and said, "You are welcome to look over the whole place." I said, "I am very much obliged to you, Madam, for this very extraordinary alteration of the tone you took when I began on the trunk assures me that the coat is not here. . . ." So I left the flat and then remarked that there was another flat on the same landing.

Although I do not positively remember, I think it likely that I was convinced that the disappearance of the other woman was connected with the marked willingness that I should search for my overcoat through the flat from which I had emerged. I certainly got the idea that the other woman did not live far off. So to begin with I knocked at the door of that opposite flat. Two yellow or yellowish girls came. I looked over their shoulders and saw a quite respectable looking parlor with a nice piano. But upon the piano was a neat bundle of just the right size and shape to contain my overcoat. I said, "I have called because there is a bundle here belonging to me; oh, yes, I see it, and will just take it." So I gently pushed beyond them, took the bundle, opened it, and found my overcoat, which I put on. I descended to the street, and reached my detective about fifteen seconds before my twelve minutes had elapsed. [1929:275-277]

Peirce's remarkable aplomb is given charming expression in a letter he sent to Superintendent C. P. Patterson, of the Coast Survey, later in the day:

I have to report that I arrived here last Saturday and my watch, the property of the Survey, was stolen from me . . . at the instant of my arrival. I at once set to work to find it and was so happy as to succeed this afternoon. I strongly hope to capture the thief tomorrow morning before seven o'clock. . . .

The next day, June 25, Peirce wrote to Superintendent Patterson that "The two negroes who stole the watch were today committed for trial. Everything had been recovered. The thief is the very man I suspected throughout contrary to the judgment of the detective."

As noted in a much later letter to his friend and disciple, the Harvard philosopher and psychologist William James (1842-1910), this story of detection was meant as an illustration of Peirce's "theory of why it is that people so often guess right." "This singular guessing instinct" (1929:

281), or the inclination to entertain a hypothesis, more commonly referred to by Peirce as *Abduction*¹ or *Retroduction*, is described as a "singular salad . . . whose chief elements are its groundlessness, its ubiquity, and its trustworthiness" (Ms. 692). As to its ubiquity, Peirce writes:

Looking out my window this lovely spring morning I see an azalea in full bloom. No, no! I do not see that; though that is the only way I can describe what I see. *That* is a proposition, a sentence, a fact; but what I perceive is not proposition, sentence, fact, but only an image, which I make intelligible in part by means of a statement of fact. This statement is abstract; but what I see is concrete. I perform an abduction when I so much as express in a sentence anything I see. The truth is that the whole fabric of our knowledge is one matted felt of pure hypothesis confirmed and refined by induction. Not the smallest advance can be made in knowledge beyond the stage of vacant staring, without making an abduction at every step. [Ms. 692]

If all new knowledge depends on the formation of a hypothesis, there nevertheless "seems at first to be no room at all for the question of what supports it, since from an actual fact it only infers a *may-be* (*may-be* and *may-be* not). But there is a decided leaning to the affirmative side and the frequency with which that turns out to be an actual fact is . . . quite the most surprising of all the wonders of the universe" (8.238). Comparing our capacity for abduction with "a bird's musical and aeronautic powers; that is, it is to us, as those are to them, the loftiest of our merely instinctive powers" (1929:282), Peirce notes that "retroduction goes upon the hope that there is sufficient affinity between the reasoner's mind and nature to render guessing not altogether hopeless, provided each guess is checked by comparison with observation" (1.121).

Peirce maintained elsewhere that the ability of a newly hatched chick to pick up food, "choosing as it picks, and picking what it aims to pick," while "not reasoning, because it is not done deliberately," is nevertheless "in every respect but that . . . just like abductive inference," and he further traces the physical and social sciences back to the animal instincts for, respectively, getting food and reproduction (Ms. 692). Retroduction is a type of instinctive behavior two classic examples of which are the migration of robins and the hive building of bees. Peirce called the seemingly intelligent behavior of the lower animals *il lume naturale*, which he considered indispensable to retroduction.² Peirce spoke of rational, animal, and vegetable instinct; as Maryann Ayim notes (1974:36), all levels of instinctive activity "have this feature in common—the activity caters to the survival and well-being of the species as a whole by enabling species members to react appropriately to environmental conditions"; this holds, as well, for man-as-a-scientist.

In today's popular view of the Victorian world, man-as-a-scientist means, above all others, Sherlock Holmes, the first practitioner of scientific crime detection, and inventor of the celebrated "Science of Deduction

and Analysis." In allusion to Holmes, Norwood Russell Hanson had made the interesting observation that: "Often the thrust of Holmes' comment, 'Simple deduction my dear Watson' [*sic*]³ is to the effect that the reasoning in question has proceeded from the previously accepted to what should be expected. But just as often the mathematician and the scientist will argue from the bottom of the page 'up'" (Bernstein 1965:59). This is one of the things Peirce identifies as "retroducting." It proceeds from an unexpected anomaly to a premiss cluster, most parts of which are already accepted.

A given object presents an extraordinary combination of characters of which we should like to have an explanation. That there is any explanation of them is a pure assumption; and if there be, it is some one hidden fact which explains them; while there are, perhaps, a million other possible ways of explaining them, if they were not all, unfortunately, false. A man is found in the streets of New York stabbed in the back. The chief of police might open a directory and put his finger on any name and guess that that is the name of the murderer. How much would such a guess be worth? But the number of names in the directory does not approach the multitude of possible laws of attraction which could have accounted for Kepler's [*sic*] law of planetary motion and, in advance of verification by predications of perturbations etc., would have accounted for them to perfection. Newton, you will say, assumed that the law would be a simple one. But what was that but piling guess on guess? Surely, vastly more phenomena in nature are complex than simple. . . . [T]here is no warrant for doing more than putting [an abduction] as an interrogation. [Ms. 692]

Abduction, that is, retroduction—"a poor name," Peirce himself confessed—is, according to one of Peirce's later formulations, which would appear to owe much to the British philosopher George Berkeley (1685-1753), a means of communication between man and his Creator, a "Divine privilege" which must be cultivated (Eisele 1976, vol. III:206). For Peirce, "according to the doctrine of chances it would be practically impossible for any being, by pure chance to guess the cause of any phenomenon," and he therefore surmises that there can "be no reasonable doubt that man's mind, having been developed under the influence of the laws of nature, for that reason naturally thinks somewhat after nature's pattern" (Peirce 1929:269). "It is evident," he writes, "that unless man had had some inward light tending to make his guesses . . . much more often true than they would be by mere chance, the human race would long ago have been extirpated for its utter incapacity in the struggles for existence . . ." (Ms. 692).

In addition to the principle that the human mind is, as a result of natural evolutionary processes, predisposed to guessing correctly about the world, Peirce proposes a second conjectural principle to partially explain the phenomenon of guessing, namely, that "we often derive from observation strong intimations of truth, without being able to specify

what were the circumstances we had observed which conveyed those intimations" (1929:282). Peirce, to return to the story of the missing watch, was unable to determine on a conscious level which of the waiters of the Fall River boat was guilty. Holding himself "in as passive and receptive a state" (1929:281) as he could during his brief interview with each waiter, it was only when he forced himself to make what appeared to be a blind guess that he realized that in fact the crook had given off some unwitting index and that he himself had perceived this telltale sign in, as he put it, an "unself-conscious" manner, having made "a discrimination below the surface of consciousness, and not recognized as a real judgment, yet in very truth a genuine discrimination" (1929:280). The processes by which we form hunches about the world are, in Peirce's conception, dependent on perceptual judgments, which contain general elements such that universal propositions may be deduced from them. On the basis of his experimental work on the psychology of perception, conducted at The Johns Hopkins University with the well-known psychologist Joseph Jastrow (1863-1944), then his student (1929; 7.21-48), Peirce maintained that these perceptual judgments are "the result of a process, although of a process not sufficiently conscious to be controlled, or, to state it more truly, not controllable and therefore not fully conscious" (5.181). The different elements of a hypothesis are in our minds before we are conscious of entertaining it, "but it is the idea of putting together what we had never before dreamed of putting together which flashes the new suggestion before our contemplation" (5.181). Peirce describes the formation of a hypothesis as "an act of *insight*," the "abductive suggestion" coming to us "like a flash" (5.181). The only difference between a perceptual judgment and an abductive inference is that the former, unlike the latter, is not subject to logical analysis.

[A]bductive inference shades into perceptual judgment without any sharp line of demarcation between them; or, in other words, our first premisses, the perceptual judgments, are to be regarded as an extreme case of abductive inferences, from which they differ in being absolutely beyond criticism. [5.181; cf. 6.522, Ms. 316]

Concerning scientific method, abduction is, according to Peirce, "merely preparatory," or "the first step of scientific reasoning" (7.218). The other "fundamentally different kinds of reasoning" in science are deduction and induction (see 1.65-68; 2.96-97; 5.145; 7.97; 7.202-207). Briefly, the step of adopting a hypothesis or a proposition which would lead to the prediction of what appear to be surprising facts is called *abduction*. The step by which the necessary and probable experiential consequences of our hypothesis are traced out is called *deduction*. *Induction* is the name Peirce gives to the experimental testing of the hypothesis.

Peirce also calls abduction "Originary Argument" since it is, of the three forms of reasoning, the "only kind of argument which starts a new

idea" (2.97), and, in fact: "Its only justification is that if we are ever to understand things at all, it must be in that way" (5.145). Similarly, "neither deduction nor induction can ever add the smallest item to the data of perception; and . . . mere percepts do not constitute any knowledge applicable to any practical or theoretical use. All that makes knowledge applicable comes to us *via* abduction" (Ms. 692).

Abduction is an instinct which relies on unconscious perception of connections between aspects of the world, or, to use another set of terms, subliminal communication of messages. It is also associated with, or rather produces, according to Peirce, a certain type of emotion, which sets it apart from either induction or deduction.

Hypothesis substitutes, for a complicated tangle of predicates attached to one subject, a single conception. Now, there is a peculiar sensation belonging to the act of thinking that each of these predicates inheres in the subject. In hypothetic inference this complicated feeling so produced is replaced by a single feeling of greater intensity, that belonging to the act of thinking the hypothetic conclusion. Now, when our nervous system is excited in a complicated way, there being a relation between the elements of the excitation, the result is a single harmonious disturbance which I call an emotion. Thus, the various sounds made by the instruments of an orchestra strike upon the ear, and the result is a peculiar musical emotion, quite distinct from the sounds themselves. This emotion is essentially the same thing as in hypothetic inference, and every hypothetic inference involves the formation of such an emotion. We may say, therefore, that hypothesis produces the *sensuous* element of thought, and induction the *habitual* element. [2.643]

Hence the pronouncement of a certain confidence and conviction of correctness which Peirce makes in relation to his detective work.

SHERLOCK HOLMES—CONSULTING SEMIOTICIAN

Peirce's account of the method by which he recovered his stolen watch bears a striking resemblance to Dr. Watson's descriptions of Sherlock Holmes in action, although there is, to our knowledge, no direct evidence that Peirce had read any of the Holmes stories or that he had met Sir Arthur Conan Doyle. It is likely, however, that Peirce heard something of at least the early Holmes stories. *A Study in Scarlet* was published in New York by Ward, Lock in 1888, and in 1890 *The Sign of Four* appeared in *Lippincott's Magazine*, the major contemporaneous rival to the *Atlantic Monthly*, which we know Peirce did read. In addition, there was already a vogue for Doyle in the United States by 1894, when the celebrated writer spent two months there giving a series of lectures and meeting his American compeers. Peirce had grown up in the company of writers of fiction and artists as well as scientists. In a letter of January 31, 1908, he wrote:

But my father was a broad man and we were intimate with literary people too. William Story the sculptor, Longfellow, James Lowell, Charles Norton, Wendell Holmes, and occasionally Emerson, are among the figures of my earliest memories. [Hardwick 1977:113]

As an adult, Peirce appears to have kept abreast of contemporaneous developments in the verbal arts, for he frequently mentions both European and American authors of his time in his reviews in *The Nation* (Ketner and Cook 1975). Edgar Allan Poe (1809-1849), moreover, seems to have been one of his favorite writers (1.251, 6.460; Ms. 689, Ms. 1539).

Judging from his references to Poe's "The Murders in the Rue Morgue," Peirce certainly had a taste for detective stories. Of course, it is generally recognized that the character Sherlock Holmes is partly modeled after Poe's Chevalier Dupin (see Messac 1929:596-602; Nordon 1966:212ff.; and Trevor Hall 1978:76), but J. L. Hitchens, in his article on Holmes as a logician, makes the good point "that in contrast to Dupin, who is the brainchild of a mathematician and a poet, Sherlock Holmes, even at his most theoretical, is the offspring of a doctor's brain, and always has his feet firmly planted on the ground" (1946:117). In addition to his specialized medical training, Arthur Conan Doyle was caught up in the general enthusiasm for science in the England of his day. By the middle of the nineteenth century, science had become a solid part of English thinking at all levels, and there was generally a "dominant tone of positivist rationality" (Messac 1929:612; cf. Nordon 1966:244). Conan Doyle himself reports: "It is to be remembered that these were the years when Huxley, Tyndall, Darwin, Herbert Spencer and John Stuart Mill were our chief philosophers, and that even the man in the street felt the strong sweeping current of their thought . . ." (1924:26). Hitchens explicitly compares the logic of Holmes with that of Mill: Holmes's "habitual method of solving these difficult problems is by his own extended version of Mill's Method of Residues" (1946:115). Hitchens is, however, on the wrong track when he claims that "Most of Holmes's reasoning is causal," citing the detective's own remark that "reasoning from effect to cause is less frequent and thus more difficult than reasoning from cause to effect" (1946:115-116).

There are frequent allusions in the Sherlock Holmes saga to Holmes as a fox-hound—particularly in *A Study in Scarlet*, *The Dancing Men*, *The Bruce-Partington Plans*, and *The Devil's Foot*. For example, in *The Boscombe Valley Mystery*, Watson writes:

Sherlock Holmes was transformed when he was hot upon such a scent as this. Men who had only known the quiet thinker and logician of Baker Street would have failed to recognize him. His face flushed and darkened. His brows were drawn into two hard black lines, while his eyes shone out from beneath them with a steely glitter. His face was bent downward, his shoulders bowed, his lips compressed, and the veins stood out like whipcord in his long, sinewy neck. His nostrils seemed to dilate with a

purely animal lust for the chase, and his mind was so absolutely concentrated upon the matter before him that a question or remark fell unheeded upon his ears, or, at the most, only provoked a quick, impatient snarl in reply.

Referring to this passage, Pierre Nordon comments: "Here we see a man transformed with all speed into a fox-hound before our very eyes, until he seems almost to have lost the power of speech and be reduced to expressing himself by sounds" (1966:217), heeding instead his instinctive, nonverbal powers of perception and abduction.

It is from such intuitive clue-gathering that Holmes is able to formulate his hypotheses, although he tends to subsume both the perceptual and the hypothetical processes under the rubric of "Observation," as in the following passage from the chapter entitled "The Science of Deduction" in *The Sign of Four*, where Holmes and Watson are discussing a French detective named François le Villard:

[Holmes]: "He possesses two out of three qualities necessary for the ideal detective. He has the power of observation and that of deduction. He is only wanting in knowledge. . . ."

[Watson]: ". . . But you spoke just now of observation and deduction. Surely the one to some extent implies the other."

[Holmes]: "Why, hardly . . . For example, observation shows me that you have been to the Wigmore Street Post-Office this morning, but deduction lets me know that when there you dispatched a telegram."

[Watson]: "Right! . . . But I confess that I don't see how you arrived at it." . . .

[Holmes]: "It is simplicity itself . . . so absurdly simple, that an explanation is superfluous; and yet it may serve to define the limits of observation and of deduction. Observation tells me that you have a little reddish mould adhering to your instep. Just opposite the Wigmore Street Office they have taken up the pavement and thrown up some earth, which lies in such a way that it is difficult to avoid treading in it in entering. The earth is of this peculiar reddish tint which is found, as far as I know, nowhere else in the neighbourhood. So much is observation. The rest is deduction."

[Watson]: "How, then, did you deduce the telegram?"

[Holmes]: "Why, of course I knew that you had not written a letter, since I sat opposite to you all morning. I see also in your open desk there that you have a sheet of stamps and a thick bundle of postcards. What could you go into the post-office for, then, but to send a wire? Eliminate all other factors, and the one which remains must be the truth."

Watson then presents Holmes with an even more difficult task, and, when the detective again excels, asks him to explain his process of reasoning. "Ah," Holmes replies, "that is good luck. I could only say what was the balance of probability. I did not expect to be so accurate." When Watson then asks if "it was not mere guesswork" he says, "No, no: I never guess. It is a shocking habit—destructive to the logical faculty," and attributes

his companion's surprise to the fact that "You do not follow my train of thought or observe the small facts upon which large inferences may depend."

Despite such disclaimers, Holmes's powers of observation, his "extraordinary genius for minutiae," as Watson puts it, and of deduction are in most cases built on a complicated series of what Peirce would have called guesses. In the preceding example, for instance, Holmes can only guess that Watson actually entered the post office, rather than having merely walked in front of it. Furthermore, Watson might have entered the post office to meet a friend rather than to conduct some business, and so forth.

That Holmes was convinced of the importance of studying details for successful detection is brought out in the following passage from *A Case of Identity*:

"You appeared to read a good deal upon her which was quite invisible to me," I remarked.

"Not invisible but unnoticed, Watson. You did not know where to look, and so you missed all that was important. I can never bring you to realize the importance of sleeves, the suggestiveness of thumb-nails, or the great issues that may hang from a boot-lace. Now, what did you gather from that woman's appearance? Describe it."

"Well, she had a slate-coloured, broad-brimmed straw hat, with a feather of a brickish red. Her jacket was black, with black beads sewn upon it, and a fringe of little black jet ornaments. Her dress was brown, rather darker than coffee colour, with a little purplish plush at the neck and sleeves. Her gloves were greyish, and were worn through at the right forefinger. Her boots I didn't observe. She had small, round, hanging gold ear-rings, and a general air of being fairly well to do, in a vulgar, comfortable, easy-going way."

Sherlock Holmes clapped his hands softly together and chuckled.

"'Pon my word, Watson, you are coming along wonderfully. You have really done very well indeed. It is true that you have missed everything of importance, but you have hit upon the method, and you have a quick eye for colour. Never trust to general impressions, my boy, but concentrate yourself upon details. My first glance is always at a woman's sleeve. In a man it is perhaps better first to take the knee of the trouser. As you observe, this woman had plush upon her sleeves, which is a most useful material for showing traces. The double line a little above the wrist, where the typewritress presses against the table, was beautifully defined. The sewing-machine, of the hand type, leaves a similar mark, but only on the left arm, and on the side of it farthest from the thumb, instead of being right across the broadest part, as this was. I then glanced at her face, and, observing the dint of a pince-nez at either side of her nose, I ventured a remark upon short sight and typewriting, which seemed to surprise her."

"It surprised me."

"But, surely, it was obvious. I was then much surprised and interested on glancing down to observe that, though the boots which she was wearing were not unlike each other, they were really odd ones; the one having a

slightly decorated toe-cap, the other a plain one. One was buttoned only in the two lower buttons out of five, and the other at the first, third, and fifth. Now, when you see that a young lady, otherwise neatly dressed, has come away from home with odd boots, half-buttoned, it is no great deduction to say that she came away in a hurry."

"And what else?" I asked. . . .

"I noticed, in passing, that she had written a note before leaving home but after being fully dressed. You observed that her right glove was torn at the forefinger, but you did not apparently see that both glove and finger were stained with violet ink. She had written in a hurry and dipped her pen too deep. It must have been this morning, or the mark would not remain clear upon the finger. All this is amusing, though rather elementary. . . ."

What makes Sherlock Holmes so successful at detection is not that he never guesses but that he guesses so well. In fact, he unwittingly follows Peirce's advice for selecting the best hypothesis (see 7.220-320). "It is an old maxim of mine," states Holmes, "that when you have excluded the impossible, whatever remains, however improbable, must be the truth" (*The Beryl Coronet*; cf. *The Sign of Four*, *The Blanched Soldier*, *The Bruce-Partington Plans*). It was Peirce's own maxim that "Facts cannot be explained by a hypothesis more extraordinary than these facts themselves; and of various hypotheses the least extraordinary must be adopted" (Ms. 696).⁴ Paraphrasing Peirce's discussion, we might say that the best hypothesis is one that is simplest and most natural, is the easiest and cheapest to test, and yet will contribute to our understanding of the widest possible range of facts. In the episode of the post office, Holmes's guesses about Watson's actions are the most reasonable under the circumstances.

Furthermore, they enable him, with the minimum of logical baggage, to reach a point from which he may, through further observation, test some of the predictions drawn from his hypothesis and thus greatly reduce the number of possible conclusions. In other words, Holmes not only selects the simplest and most natural hypothesis, but also "breaks a hypothesis up into its smallest logical components, and only risks one of them at a time," the latter procedure being what Peirce describes as the secret of the game of Twenty Questions (7.220; cf. 6.529). Taking the hypothesis that Watson entered the post office in order to conduct some postal business, Holmes deduces (in Peirce's sense) that such business would be either to send a letter, purchase stamps and/or postcards, or send a telegram. He then systematically tests each of these possibilities, quickly coming to what turned out to be the correct one. When several explanations are possible, "one tries test after test until one or other of them has a convincing amount of support" (*The Blanched Soldier*).

One of us (Sebeok 1979: chap. 5) has discussed Peirce's reflections about guessing in the context of some children's games, on the one hand, and certain stage illusions, on the other. The game of Twenty Questions

is the full verbal equivalent to the game of Hot and Cold, in which verbal cueing is minimal. A verbal cueing, unwittingly emitted, guides the performer in certain types of magic acts, where verbal cues are excluded altogether, to the object sought. This a verbal communication, or feedback, also accounts for such seemingly "occult" phenomena as the movement of a Ouija board, table tipping, and automatic writing, and is the basis of several types of mentalists' acts, variously known in the magic business as "muscle reading" or "thought-reading." In acts of this sort "The spectator thinks he is being led by the magician, but actually the performer permits the *spectator to lead him* by unconscious muscular tensions" (Gardner 1957:109). The best mentalists are able to dispense with bodily contact altogether, finding what they are seeking merely by observing the reactions of spectators in the room.⁵

As we have already noted, Peirce maintained that a hypothesis must always be considered as a question, and, while all new knowledge comes from surmises, these are useless without the test of inquiry. Holmes, too, remarks, to Watson in *The Speckled Band*, "how dangerous it always is to reason from insufficient data." The detective also agrees with Peirce (2.635; 6.524; 7.202) that prejudices, or hypotheses which we are reluctant to submit to the test of induction, are a major stumbling block to successful reasoning. Holmes notes, for example, that "I make a point of never having any prejudices" (*The Reigate Puzzle*; cf. *The Abbey Grange*, *The Naval Treaty*). Peirce's admiration for great figures in the history of science, such as Kepler, stems precisely from their extraordinary capacity for sustaining the guessing-testing-guessing chain.

It is on this point, concerning the maintenance of objectivity toward the facts of a case, that Holmes, much like Peirce in the story that opens this book, finds himself at odds with the official representatives of the police, or, in the case of Peirce, the Pinkerton professionals.⁶ In *The Boscombe Valley Mystery*, for example, Holmes attempts to point out some critical clues to the detective from Scotland Yard, Inspector Lestrade, who, as usual, cannot see the relationship between the details unearthed by Holmes and the crime being investigated. When he replies, "I am afraid that I am still a skeptic," Holmes answers calmly, "You work your own method, and I shall work mine." Holmes later describes this conversation to Watson as follows:

"By an examination of the ground I gained the trifling details which I gave to that imbecile Lestrade, as to the personality of the criminal."

"But how did you gain them?"

"You know my method. It is founded upon the observation of trifles."

What so often leads the police astray in the Holmes stories is that, early in the investigation of a crime, they tend to adopt the hypothesis which is most likely to account for a few outstanding facts, ignoring "trifles" and thereafter refusing to consider data that do not support their position.

"There is nothing more deceptive than an obvious fact," says Holmes in *The Boscombe Valley Mystery*. The police also make the "capital mistake" of theorizing before they have all the evidence (*A Study in Scarlet*). The result is that, "insensibly," they begin "to twist facts to suit theories, instead of theories to suit facts" (*A Scandal in Bohemia*). The mutual distrust that results from this major difference in methodology pervades the Holmes stories. In *The Reigate Puzzle*, Watson remarks to a country official, Inspector Forrester, that "I have usually found that there was method in his [Holmes's] madness," to which the inspector replies, "Some folk might say there was madness in his method."⁷

We are not the first to point out the importance of guessing in Sherlock Holmes's method of detection. Régis Messac, for example, speaking of Holmes's reading of Watson's mind in *The Cardboard Box* (cf. the almost identical scene in some editions of *The Resident Patient*), notes that there are a million things that Watson might be thinking about when he is looking at the portrait of General Gordon or that of Henry Ward Beecher, and that Holmes is in fact guessing (1929:599). Messac is correct in pointing out that, although Holmes occasionally admits that a kind of instinct for guessing is involved in his work (e.g., he admits, in *A Study in Scarlet*, that his "curious gifts of instinct and observation" are due to a "kind of intuition"—a sentiment he echoes in *The Sign of Four* and *The Problem of Thor Bridge*), he nevertheless "affirms the reality of 'deduction'" (1929:601). Messac also argues that Holmes's deductions are not true deductions at all, nor are they inductions properly speaking, "but rather reasonings founded upon the observation of one particular fact and leading, through more or less complex circumventions, to another particular fact" (1929:602). And Nordon concludes that "it must be said that in practice he [Holmes] gets much more conclusive results from observation than from logical processes" (1966:245).

Marcello Truzzi, in a searching article on Holmes's method (1973: 93-126), anticipated our present work by pointing to the similarities between the detective's so-called deductions, or inductions, and Peirce's abductions, or conjectures. According to Peirce's system of logic, furthermore, Holmes's observations are themselves a form of abduction, and abduction is as legitimate a type of logical inference as either induction or deduction (Peirce 8.228). In fact, Peirce maintains that:

Nothing has so much contributed to present chaotic or erroneous ideas of the logic of science as failure to distinguish the essentially different characters of different elements of scientific reasoning; and one of the worst of these confusions, as well as one of the commonest, consists in regarding abduction and induction taken together (often mixed also with deduction) as a simple argument. [8.228]

Peirce admits that he himself, "in almost everything [he] printed before the beginning of this century . . . more or less mixed up Hypothesis and Induction" (8.227), and he traces the confusion of these two types of

reasoning to logicians' too "narrow and formalistic a conception of inference (as necessarily having formulated judgments from its premises)" (2.228; cf. 5.590-604; Ms. 475; Ms. 1146).

Abduction and induction do, of course, "both lead to the acceptance of a hypothesis because observed facts are such as would necessarily or probably result as consequences of that hypothesis." But:

Abduction makes its start from the facts, without, at the outset, having any particular theory in view, though it is motivated by the feeling that a theory is needed to explain the surprising facts. Induction makes its start from a hypothesis which seems to recommend itself, without at the outset having any particular facts in view, though it feels the need of facts to support the theory. Abduction seeks a theory. Induction seeks for facts. In abduction the consideration of the facts suggests the hypothesis. In induction the study of the hypothesis suggests the experiments which bring to light the very facts to which the hypothesis had pointed. [7.218]

Taking an example which could have been drawn from one of Holmes's cases, Peirce provides the following demonstration of the difference between these two types of reasoning:

A certain anonymous writing is upon a torn piece of paper. It is suspected that the author is a certain person. His desk, to which only he has had access, is searched, and in it is found a piece of paper, the torn edge of which exactly fits, in all its irregularities, that of the paper in question. It is a fair hypothetic inference that the suspected man was actually the author. The ground of this inference evidently is that two torn pieces of paper are extremely unlikely to fit together by accident. Therefore, of a great number of inferences of this sort, but a very small proportion would be deceptive. The analogy of hypothesis with induction is so strong that some logicians have confounded them. Hypothesis has been called an induction of characters. A number of characters belonging to a certain class are found in a certain object; whence it is inferred that all the characters of that class belong to the object in question. This certainly involves the same principle as induction; yet in a modified form. In the first place, characters are not susceptible of simple enumeration like objects; in the next place, characters run in categories. When we make an hypothesis like that about the piece of paper, we only examine a single line of characters, or perhaps two or three, and we take no specimen at all of others. If the hypothesis were nothing but an induction, all that we should be justified in concluding, in the example above, would be that the two pieces of paper which matched in such irregularities as have been examined would be found to match in other, say slighter, irregularities. The inference from the shape of the paper to its ownership is precisely what distinguishes hypothesis from induction, and makes it a bolder and more perilous step. [2.632]

Holmes indirectly acknowledges the more dangerous nature of hypothesis when he advocates the use of "imagination" (*The Retired Colourman*,

Silver Blaze), "intuition" (*The Sign of Four*), and "speculation" (*The Hound of the Baskervilles*). One must be willing to imagine what happened and act upon such surmise, and this takes one "into the region where we balance probabilities and choose the most likely" (*The Hound of the Baskervilles*).

Holmes was known to oscillate between the almost frenzied single-mindedness of the fox-hound on the trail of his quarry and a sort of lethargic reverie, a combination John G. Cawelti calls "stereotype vitalization" (1976:11,58), an imaginative synthesis of figure types I. I. Revzin dubbed "fusion," also with specific reference to detective fiction (1978: 385-388). The device, in this context, of course, derives from Poe's ambiguous Dupin. Watson points out, in the following passage from *The Red-Headed League*, that the latter type of activity was also important to Holmes's detection:

My friend was an enthusiastic musician, being himself not only a very capable performer but a composer of no ordinary merit. All the afternoon he sat in the stalls wrapped in the most perfect happiness, gently waving his long, thin fingers in time to the music, while his gently smiling face and his languid, dreamy eyes were as unlike those of Holmes, the sleuth-hound, Holmes the relentless, keen-witted, ready-handed criminal agent, as it was possible to conceive. In his singular character the dual nature alternately asserted itself, and his extreme exactness and astuteness represented, as I have often thought, the reaction against the poetic and contemplative mood which occasionally predominated in him. The swing of his nature took him from extreme languor to devouring energy; and, as I knew well, he was never so truly formidable as when, for days on end, he had been lounging in his armchair amid his improvisations and his blackletter editions. Then it was that the lust of the chase would suddenly come upon him, and that his brilliant reasoning power would rise to the level of intuition, until those who were unacquainted with his methods would look askance at him as on a man whose knowledge was not that of other mortals. When I saw him that afternoon so enraptured in the music at St. James's Hall I felt that an evil time might be coming upon those whom he set himself to hunt down.

Peirce has also commented on the relationship between such mental activities and more mundane practices. "There is," he writes, "a certain agreeable occupation of mind which . . . involves no purpose save that of casting aside all serious purpose" and which "I have sometimes been half-inclined to call . . . reverie with some qualification; but for a frame of mind so antipodal to vacancy and dreaminess such a designation would be too excruciating a misfit. In fact, it is Pure Play" (6.458). One type of Pure Play, "a lively exercise of one's powers" with "no rules, except this very law of liberty," he names Musement, and defines as a process by which the mind searches for "some connection" between two of the three Universes of Experience (*viz.*, of Ideas, of Brute Actuality, and of Signs [6.455]). "with speculation concerning its cause" (6.458). Musement

begins passively enough with drinking in the impression of some nook in one of the three Universes. But impression soon passes into attentive observation, observation into musing, musing into a lively give and take of communion between self and self. If one's observations and reflections are allowed to specialize themselves too much, the Play will be converted into scientific study. . . . [6.459]

Crime, Peirce notes, is particularly suited to the application of Musement. Citing Dupin's remarks in Poe's "The Murders in the Rue Morgue" (to wit: "It appears to me that this mystery is considered insoluble for the very reason which should cause it to be regarded as easy of solution. I mean the *outré* character of its features"), Peirce remarks that "those problems that at first blush appear utterly insoluble receive, in that very circumstance . . . [t]heir smoothly-fitting keys. This particularly adapts them to the Play of Musement" (6.460). Compare Holmes's remarks: "I have already explained to you that what is out of the common is usually a guide rather than a hindrance" (*A Study in Scarlet*); "Singularity is almost invariably a clue" (*The Boscombe Valley Mystery*); "The more *outré* and grotesque an incident is the more carefully it deserves to be examined, and the very point which appears to complicate a case is, when duly considered and scientifically handled, the one which is most likely to elucidate it" (*The Hound of the Baskervilles*); and, "It is only the colourless, uneventful case which is hopeless" (*Shoscombe Old Place*).

We agree, but for different reasons, then, with Nordon's opinion that "As the creation of a doctor who had been soaked in the rationalist thought of the period, the Holmesian cycle offers us for the first time the spectacle of a hero triumphing again and again by means of logic and scientific method. And the hero's prowess is as marvelous as the power of science, which many people hoped would lead to a material and spiritual improvement of the human condition, and Conan Doyle first among them" (1966:247).

DISEASE, CRIME, AND SEMIOTICS

The roots of semiotics are grounded in ancient medical treatises (Sebeok 1976:4,125f., 181f.; 1979: chap. 1), illustrating Peirce's contention that "Speaking in a broad, rough way, it may be said that the sciences have grown out of the useful arts, or out of arts supposed to be useful." As astronomy has evolved out of astrology, and chemistry out of alchemy, so, too, "physiology, taking medicine as a halfway out of magic" (1.226). Peirce appears to have been well versed in the history and theory of medicine. His family considered him headed toward a career in chemistry and made available to him the medical library of his late Uncle Charles, who had been a physician (Fisch: personal communication). In at least one place (2.1121), Peirce lists some of the books on the history of medicine which he had consulted. In 1933, in an interview with Henry S. Leonard (a graduate student in philosophy at Harvard who had been

sent to Peirce's home in Milford, Pennsylvania, following the death of his widow, Juliette Peirce, to collect any remaining manuscripts), Peirce's last attending physician, G. Alto Pobe, claimed that

Peirce knew more about medicine than I did. When I went to see him I would stay with him a half-hour to an hour at a time. It did you good to talk to him. When I arrived he would often tell me all of his symptoms and diagnose his illness. Then he would tell me the whole history of the medical treatment for this illness. Then he would tell me what should be prescribed for him now. He was never wrong. He said he had to ask me to write out the prescriptions since he did not have an M.D. degree. [In the notes of Max H. Fisch]

Peirce acknowledges that, concerning statistical problems relating to sampling and induction, "The medical men . . . deserve special mention for the reason that they have had since Galen a logical tradition of their own," and, "in their working against reasoning '*post hoc, ergo propter hoc*,' recognize, 'however dimly,' the rule of induction that states that 'we must first decide for what character we propose to examine the sample, and only after that decision examine the sample'" (1.95-97). Peirce recognizes, on the other hand, that medicine, that "materialistic profession" (8.58), has difficulty adhering to another maxim of induction, which requires that samples not be small ones:

It is by violating this maxim that figures are made to lie. Medical statistics in particular are usually contemptibly small, as well as open to the suspicion of being picked. I am speaking now of the statistics of reputable physicians. It is extremely difficult to collect numerous facts relating to any obscure point in medicine, and it is still more difficult to make it evident that those facts are a fair representation of the general run of events. This accounts for the slow progress of medical science notwithstanding the immense study which has been bestowed upon it and for the great errors which will often be received for centuries by physicians. Probably there is no branch of science which is so difficult in every point of view. It requires a really great mind to make a medical induction. This is too obvious to require proof. There are so many disturbing influences—personal idiosyncrasies, mixture of treatment, accidental and unknown influences, peculiarities of climate, race, and season,—that it is particularly essential that the facts should be very numerous and should be scrutinized with the eye of a lynx to detect deceptions. And yet it is peculiarly difficult to collect facts in medicine. One man's experience can seldom be of decisive weight, and no man can judge of matters beyond his personal knowledge in medicine, he must trust to the judgment of others. So that while a sample requires to be more extensive and more carefully taken in this science than in any other, in this more than in any other these requisites are difficult to fulfill.

Nothing, therefore, more pitifully manifests the looseness with which people in general reason than the readiness of nine persons out of ten to pronounce upon the merits of a medicine upon the most limited, the

most inexact, and the most prejudiced experience which it is possible to call experience at all. Any old woman who has seen any amelioration of symptoms follow after the administration of a medicine in a dozen cases at all resembling one another, will not hesitate to pronounce it an infallible cure for any case resembling at all any one of the dozen. This is shocking. But what is worse still, treatment will be recommended even upon a hearsay acquaintance with one or two cases.

Observe, I pray you, the combination of fallacies involved in such a procedure. In the first place, no induction can, with propriety, be drawn unless a sample has been taken of some definite class. But these foolish creatures—who think that merely spending time in a sick-room has made Galens of them—are utterly unable to define the disease in question. Suppose it to be *diphtheria* [sic] for instance. How do they know diphtheria [sic] from sore throat? Their samples are in reality samples of no definite class at all.

In the second place, the number of their instances is scarcely sufficient for the simplest induction. In the third place the instances are very likely derived from hearsay. Now in addition to the inaccuracy which attaches to this kind of evidence, we are more likely to hear of extraordinary things relatively to their frequency than we are of ordinary ones. So that to take into account such instances is to take picked samples. In the fourth place, the predicate which belongs to all the instances in common is usually utterly vague. In the fifth place, a deduction is usually made respecting a case in hand without carefully considering whether it really comes under the class from which the sample was drawn. In the sixth place more is apt to be predicated of the case in hand than has been found of the previous instances. All these fallacies are combined in a sort of argument which one can scarcely go a week without hearing an instance of. [Ms. 696]^a

Reviewing the large number of examples of medical diagnosis in the Holmes stories (diseases of the heart and tropical diseases especially), Maurice Campbell, himself a heart specialist, concludes that, medically speaking, "Watson seems to have been excellently informed" (1935:13). It is interesting to note that while Watson successfully follows the logical method of diagnosis with regard to pathology of the body, he is singularly inept in transferring this method to the detection of crime, and provides an example of someone who is only incompletely versed in what Peirce termed *logica docens* (see p. 46, below).

To the extent that the character Sherlock Holmes himself practices the methods of medicine, an element of art and magic is blended into the logic of scientific discovery that he pursues. In our opinion, this is what sets Holmes apart as a character from the more purely logical method of Edgar Allan Poe's detective Dupin.⁹

It is by now well recognized that Conan Doyle, a practicing physician himself until the Holmes stories made him rich enough to give up his practice, patterned the character of Sherlock Holmes after his professor, Dr. Joseph Bell, of the Royal Infirmary of Edinburgh. Conan Doyle's

partial use of a doctor as a model was, however, a conscious attempt to introduce a more rigorous scientific method into criminal detection than was used theretofore. Messac correctly notes that Doyle followed Bell regarding diagnosis extended to the entire personality and life of the patient, and that diagnosis "is never absolutely rigorous; it involves irresolutions, errors." Detection of crime, like medicine, is a sort of "pseudo-science" (1929:617). Writing of the birth of *A Study in Scarlet*, Doyle wrote:

Gaboriau had rather attracted me by the neat dovetailing of his plots, and Poe's masterful detective, Chevalier Dupin, had from boyhood been one of my heroes. But could I bring an addition of my own? I thought of my old teacher Joe Bell, of his eagle face, of his curious ways, of his eerie trick of spotting details. If he were a detective he would surely reduce this fascinating but unorganized business to something near to an exact science. [1924:69]

Doyle was impressed by Bell's exceptional ability at diagnosis, "not only of disease, but of occupation and character." He was Bell's outpatient clerk, which meant that he had to "array his out-patients, make simple notes of their cases, and then show them in, one by one, to the large room in which Bell sat in state surrounded by his dressers and students" (1924:20). The young medical student then "had ample chance of studying his [Bell's] methods and of noticing that he often learned more of the patient by a few glances" (ibid.) than by Doyle's own series of questions preceding the interview with the doctor.

Occasionally the results were very dramatic, though there were times when he blundered. In one of his best cases he said to a civilian patient:

"Well, my man, you've served in the army."

"Aye, sir."

"Not long discharged?"

"No, sir."

"A highland regiment?"

"Aye, sir."

"A non-com. officer?"

"Aye, sir."

"Stationed at Barbados?"

"Aye, sir."

"You see, gentlemen," he would explain, "the man was a respectful man, but did not remove his hat. They do not in the army, but he would have learned civilian ways had he been long discharged. He has an air of authority and he is obviously Scottish. As to Barbados, his complaint is elephantiasis, which is West Indian and not British."

To his audience of Watsons it all seemed quite miraculous until it was explained, and then it became simple enough. It is no wonder that after the study of such a character I used and amplified his methods when in later

life I tried to build up a scientific detective who solved cases on his own merits and not through the folly of the criminal. [1924:20-21]

While the Barbados dialogue was the only example of Bell's skill in observation and deduction recorded by Doyle himself, several other accounts of Bell's remarkable performances, noted down by physicians who were medical students with Doyle at Edinburgh or friends of Dr. and Mrs. Bell, have been published and are reviewed by Trevor Hall (1978:80-83). William S. Baring-Gould has reproduced one of the lesser-known anecdotes (from the *Lancet*, of August 1, 1956):

A woman with a small child was shown in. Joe Bell said good morning to her and she said good morning in reply.

"What sort of crossing di' ye have fra' Burntisland?"

"It was guid."

"And had ye a guid walk up Inverleith Row?"

"Yes."

"And what did ye do with th' other wain?"

"I left him with my sister in Leith."

"And would ye still be working at the linoleum factory?"

"Yes, I am."

"You see, gentlemen, when she said good morning to me I noted her Fife accent, and, as you know, the nearest town in Fife is Burntisland. You notice the red clay on the edges of the soles of her shoes, and the only such clay within twenty miles of Edinburgh is the Botanical Gardens. Inverleith Row borders the gardens and is her nearest way here from Leith. You observed that the coat she carried over her arm is too big for the child who is with her, and therefore she set out from home with two children. Finally she has dermatitis on the fingers of the right hand which is peculiar to workers in the linoleum factory at Burntisland." [1967:vol.1,7]

Or consider the following report of an interview with Doyle, in June 1892, originally published in an article by a Mr. Harry How entitled "A Day with Dr. Conan Doyle," which appeared in the *Strand Magazine* in August of the same year, and was reprinted by Hall (1978:82-83):

[At Edinburgh] I met the man who suggested Sherlock Holmes to me . . . his intuitive powers were simply marvelous. Case No. 1 would step up. "I see," said Mr. Bell, "You're suffering from drink. You even carry a flask in the inside breast pocket of your coat." Another case would come forward. "Cobbler, I see." Then he would turn to the students, and point out to them that the inside of the knee of the man's trousers was worn. That was where the man had rested the lapstone—a peculiarity only found in cobblers.

Hall (1978:78) also notes that Doyle acknowledged his debt to Bell on the verso of the title page of *The Adventures of Sherlock Holmes* (1892), where he dedicates the book to his former teacher. Hall further reports that, in a letter of May 4, 1892, to Bell, Doyle explained:

It is most certainly to you that I owe Sherlock Holmes, and though in the stories I have the advantage of being able to place [the detective] in all sorts of dramatic positions, I do not think that his analytical work is in the least an exaggeration of some effects which I have seen you produce in the outpatient ward. Round the centre of deduction and inference and observation which I have heard you inculcate, I have tried to build up a man who pushed the thing as far as it would go—further occasionally—and I am so glad that the results satisfied you, who are the critic with the most right to be severe. [1978:78]

Certainly the following passage from *The Greek Interpreter* echoes to a startling degree some of the anecdotes involving Joseph Bell. Holmes and his brother Mycroft are seated together in the bow window¹⁰ of the Diogenes Club, when Mycroft says:

"To anyone who wishes to study mankind this is the spot. . . . Look at the magnificent types! Look at these two men who are coming towards us, for example."

"The billiard-marker and the other?"

"Precisely. What do you make of the other?"

The two men had stopped opposite the window. Some chalk marks over the waistcoat pocket were the only signs of billiards which I [Watson] could see in one of them. The other was a very small, dark fellow, with his hat pushed back and several packages under his arm.

"An old soldier, I perceive," said Sherlock.

"And very recently discharged," remarked the brother.

"Served in India, I see."

"And a non-commissioned officer."

"Royal Artillery, I fancy," said Sherlock.

"And a widower."

"But with a child."

"Children, my dear boy, children."

"Come," said I [i.e., Watson], laughing, "this is a little too much."

"Surely," answered Holmes, "it is not hard to see that a man with that bearing, expression of authority, and sun-baked skin is a soldier, is more than a private, and is not long from India."

"That he has not left the service long is shown by his still wearing his ammunition boots, as they are called," observed Mycroft.

"He had not the cavalry stride, yet he wore his hat on one side, as is shown by the lighter skin on that side of his brow. His weight is against his being a sapper. He is in the artillery."

"Then, of course, his complete mourning shows that he has lost someone very dear. The fact that he is doing his own shopping looks as though it were his wife. He has been buying things for children, you perceive. There is a rattle, which shows that one of them is very young. The wife probably died in childbed. The fact that he has a picture-book under his arm shows that there is another child to be thought of."

Bell himself brings out the similarity between crime and disease in the following passage, written in 1893 and cited by Starrett (1971:25-26):

Try to learn the features of a disease or injury, gentlemen, as precisely as you know the features, the gait, the tricks of manner of your most intimate friend. Him, even in a crowd, you can recognize at once. It may be a crowd of men dressed all alike, and each having his full complement of eyes, nose, hair and limbs. In every essential they resemble one another; only in trifles do they differ—and yet, by knowing these trifles well, you make your recognition or your diagnosis with ease. *So it is with disease of mind or body or morals.* Racial peculiarities, hereditary tricks of manner, accent, occupation or the want of it, education, environment of every kind, by their little trivial impressions gradually mould or carve the individual, and leave finger marks or chisel scores which the expert can detect. The great broad characteristics which at a glance can be recognized as indicative of heart disease or consumption, chronic drunkenness or long-continued loss of blood, are the common property of the veriest tyro in medicine, while to masters of their art there are myriads of signs eloquent and instructive, but which need the educated eye to discover. . . . *The importance of the infinitely little is incalculable.* Poison a well at Mecca with the cholera bacillus and the holy water which the pilgrims carry off in bottles will infect a continent. The rags of a victim of a plague will terrify every seaport in Christendom. [Emphasis ours]

This manner of viewing symptoms as distinctive features of the identity of a disease, which is then treated as a concrete entity, brings to mind a passage in one of Peirce's unpublished manuscripts (Ms. 316), where, explaining that "our knowledge of the majority of general conceptions comes about in a manner altogether analogous to our knowledge of an individual person," he criticizes the dictum of French physiologist Claude Bernard (1813-1878) that "Disease is not an entity; it is nothing but an assemblage of symptoms." Peirce maintains that, rather than a physiological doctrine, it is one of false logic. "But in the light of the positive discoveries of Pasteur and Koch, considered in connection with the theories of Weissmann [*sic*], we see that, as far as zymotic [i.e., infectious] diseases are concerned, they are just as much a thing as the ocean is a thing . . . [An] assemblage of symptoms [*is*] not only an entity but necessarily a concrete thing. . . ." Had Bernard understood this, Peirce goes on to say, "he might have set himself to work very usefully to obtain some further acquaintance with that thing."

Sherlock Holmes does indeed practice what Bell preaches. He builds up to a "diagnosis," that is, an identification of a criminal pathology, through a series of minute perceptions, linked together by hypothesis, and he furthermore usually ends by treating a former case like an old familiar friend. Consider, for example, the following often-cited account of Holmes reading Watson's mind, from *The Cardboard Box*:

Finding that Holmes was too absorbed for conversation, I had tossed aside the barren paper, and, leaning back in my chair, I fell into a brown study. Suddenly my companion's voice broke in upon my thoughts.

"You are right, Watson," said he. "It does seem a very preposterous way of settling a dispute."

"Most preposterous!" I exclaimed, and then, suddenly realizing how he had echoed the inmost thought of my soul, I sat up in my chair and stared at him in blank amazement.

"What is this, Holmes?" I cried. "This is beyond anything which I could have imagined. . . . I have been seated quietly in my chair, and what clues can I have given you?"

"You do yourself an injustice. The features are given to man as the means of which he shall express his emotions, and yours are faithful servants."

"Do you mean to say that you read my train of thoughts from my features?"

"Your features, and especially your eyes. Perhaps you cannot yourself recall how your reverie commenced?"

"No, I cannot."

"Then I will tell you. After throwing down your paper, which was the action which drew my attention to you, you sat for half a minute with a vacant expression. Then your eyes fixed themselves upon your newly framed picture of General Gordon, and I saw by the alteration in your face that a train of thought had been started. But it did not lead very far. Your eyes turned across to the unframed portrait of Henry Ward Beecher, which stands up upon the top of your books. You then glanced up at the wall, and of course your meaning was obvious. You were thinking that if the portrait were framed it would just cover that bare space and correspond with Gordon's picture over there."

"You have followed me wonderfully!" I exclaimed.

"So far I could hardly have gone astray. But now your thoughts went back to Beecher, and you looked hard across as if you were studying the character in his features. Then your eyes ceased to pucker, but you continued to look across, and your face was thoughtful. You were recalling the incidents of Beecher's career. I was well aware that you could not do this without thinking of the mission which he undertook on behalf of the North at the time of the Civil War, for I remember you expressing your passionate indignation at the way in which he was received by the more turbulent of our people. You felt so strongly about it that I knew you could not think of Beecher without thinking of that also. When a moment later I saw your eyes wander away from the picture, I suspected that your mind had now turned to the Civil War, and when I observed that your lips set, your eyes sparkled, and your hands clinched, I was positive that you were indeed thinking of the gallantry which was shown by both sides in that desperate struggle. But then, again, your face grew sadder; you shook your head. You were dwelling upon the sadness and horror and useless waste of life. Your hand stole toward your own old wound, and a smile quivered on your lips, which showed me that the ridiculous side of this method of settling international questions had forced itself upon your mind. At this point I agreed with you that it was preposterous, and was glad to find that all my deductions had been correct."

"Absolutely!" said I. "And now that you have explained it, I confess that I am as amazed as before."

Testing a hypothesis as to the identity of a person through the collection of clues from that individual's physical appearance, speech patterns, and

the like always involves a certain amount of guessing, for which reason Peirce calls it *abductive induction*:

But suppose that, while I am travelling upon a railway, somebody draws my attention to a man near us, and asks me whether he is not something allied to a catholic priest. I thereupon begin to run over in my mind the observable characteristics of ordinary catholic priests, in order to see what proportion of them this man displays. Characteristics are not capable of being counted or measured; their relative significance in reference to the question put can only be vaguely estimated. Indeed, the question itself admits of no precise answer. Nevertheless, if the man's style of dress,—boots, trousers, coat, and hat,—are such that are seen on the majority of American catholic priests, if his movements are such as are characteristic of them, betraying a similar state of nerves, and if the expression of countenance, which results from a certain long discipline, is also characteristic of a priest, while there is a single circumstance very unlike a Roman priest, such as his wearing a masonic emblem, I may say he is not a priest, but he has been, or has been near becoming, a catholic priest. This sort of vague induction, I term an *abductive induction*. [Ms. 692; cf. 6.526]

In the preceding example, the question put to Peirce is itself an hypothesis, similar in some respects to the inference noted in an autobiographical passage from another Peirce paper, where he writes:

I once landed at a seaport in a Turkish province; and, as I was walking up to the house which I was to visit, I met a man upon horseback, surrounded by four horsemen holding a canopy over his head. As the governor of the province was the only personage I could think of who could be so greatly honored, I inferred that this was he. This was an hypothesis. [2.625]

The above examples illustrate what Sherlock Holmes refers to as "reasoning backward" (cf. Peirce's *retro-duction*), a skill which, while similar in many respects to the type of thinking in which the common man engages in his everyday life, nevertheless requires a certain amount of specialized training:

"In solving a problem of this sort, the grand thing is to be able to reason backward. That is a very useful accomplishment, and a very easy one, but people do not practice it much. In the everyday affairs of life it is more useful to reason forward, and so the other comes to be neglected. There are fifty who can reason synthetically for one who can reason analytically."

"I confess," said I [Watson], "that I do not quite follow you."

"I hardly expected that you would. Let me see if I can make it clearer. Most people, if you describe a train of events to them, will tell you what the result would be. They can put those events together in their minds, and argue from them that something will come to pass. There are few people,

however, who, if you told them a result, would be able to evolve from their own inner consciousness what the steps were which led up to that result. This power is what I mean when I talk of reasoning backward, or analytically." [A Study in Scarlet]

Holmes, in fact, frequently remarks to Watson that he sees just what everyone else sees, only he has trained himself to apply his method in order to determine the full significance of his perceptions. In *The Blue Carbuncle*, for example, Watson is asked by Holmes to examine a hat in order to find a clue as to the identity of the gentleman who had worn it. "I can see nothing," is Watson's reply, to which Holmes responds, "On the contrary, Watson, you see everything. You fail, however, to reason from what you see. You are too timid in drawing your inferences." Or, again, in *The Speckled Band*, when Watson says, "You have evidently seen more in these rooms than was visible to me," Holmes replies, "No, but I fancy that I may have deduced a little more. I imagine that you saw all that I did."

Holmes, then, like Peirce, is more interested in his method than in the particular subject matter to which it is applied. In *The Copper Beeches*, for example, Holmes and Watson discuss the way in which the latter has reported the cases of the former, and Holmes criticizes Watson, saying, "You have erred perhaps in attempting to put colour and life into each of your statements instead of confining yourself to the task of placing upon record that severe reasoning from cause to effect which is really the only notable feature about the thing." When, in response, Watson implies that Holmes's criticism is based on egotism, Holmes answers, "No, it is not selfishness or conceit. . . . If I claim full justice for my art, it is because it is an impersonal thing—a thing beyond myself. Crime is common. Logic is rare. Therefore it is upon the logic rather than upon the crime that you should dwell. You have degraded what should have been a course of lectures into a series of tales."

Peirce himself distinguished between what he called *logica utens*, or a rudimentary sense of logic-in-use, which is a certain general method by which everyone acquires truth, without, however, being aware of doing so and without being able to specify in what that method consists, and a more sophisticated sense of logic, or *logica docens*, practiced by logicians and scientists (but also certain detectives and medical doctors), which is a logic which may be self-consciously taught and is therefore a theoretically developed method of discovering truth (Ms. 692; cf. Ransdell 1977:165). The scientist or logician does not, however, invent his *logica docens*, but rather studies and develops the natural logic he and everyone else already use in daily life. Sherlock Holmes would appear to share this view, judging from his speech to Watson, at the opening of *A Case of Identity*, in which he remarks: "We would not dare to conceive the things which are really mere commonplaces of existence. . . . Depend upon it, there is nothing so unnatural as the commonplace." Holmes as-

serts, furthermore, that his methods are "but systematized common sense" (*The Blanched Soldier*).

The ideal reasoner . . . would, when he had once been shown a single fact in all its bearings, deduce from it not only the chain of events which led up to it but also the results which would follow from it. As Cuvier could correctly describe a whole animal by the contemplation of a single bone, so the observer who has thoroughly understood one link in a series of incidents should be able to accurately state all the other ones, both before and after. [*The Five Orange Pips*]

There seems to be little doubt that the *logica docens* of Sherlock Holmes stems in large part from the scientific training of his creator, Conan Doyle. Doyle's teacher, Bell, in fact, had written that "Dr. Conan Doyle's education as a student of medicine taught him to observe, and his practise, both as a general practitioner and a specialist, has been a splendid training for a man such as he is, gifted with eyes, memory and imagination" (Bell 1893, cited in Nordon 1966:213). In particular, the controlling awareness exhibited by Holmes would appear to owe much to his dedication to chemistry.¹¹ While "the façade of chemical research, never very strong, became less and less well-maintained as time went on, until it collapsed entirely," Holmes's chemical corner served "to keep him in practical touch with an exact science where cause and effect, action and reaction, followed each other with a predictability beyond the power of the less precise 'science of detection' to achieve, however hard he might strive toward exactitude in his chosen profession" (Trevor Hall 1978:36-37). As Holmes proclaimed in *A Study in Scarlet*: "Like all other Arts, the Science of Deduction and Analysis is one which can only be acquired by long and patient study, nor is life long enough to allow any mortal to attain the highest possible perfection in it."

Peirce himself had a life-long devotion to chemistry. In 1909, he wrote:

I early became interested in a childish way in dynamics and physics and my father's brother being a chemist, I must have been about twelve years when I set up a chemical laboratory of my own and began to work through Liebig's hundred bottles of qualitative analysis and to make such things as vermilion both in the dry and in the wet way and to repeat a great many well-known processes of chemistry. [Ms. 619]

Chemistry was the profession for which Peirce was specially educated, and it was "the science in which [he had] worked the most" and "whose reasoning [he] most admire[d]" (Ms. 453; cf. Hardwick 1977:114).

For the person unschooled in theoretical logic, an exhibition of the reasoning skills of an expert will, if he is unenlightened by the latter as to the logical steps which he followed, appear to be very much like magic. Nordon points out that "His deductions lead Holmes to make revelations which appear almost magical" (1966:222). Dr. Watson is, as every-

one knows, constantly overwhelmed by the deductions of Holmes. This effect is heightened by Holmes's "notable taste . . . for theatrical arrangement and dramatic effects" (Starrett 1971:29), an inclination that he shares with Peirce, judging from the dramatic way in which the latter related the story of the missing watch, as well as from the fact that he was reputed to have shown quite an interest in and talent for drama from boyhood on.

The Peirce family had for generations displayed an interest in theater and opera, even entertaining performers in their home. While still a boy, Peirce is reported to have distinguished himself as an orator, both through the reading of such works as Poe's "The Raven" and as a member of his high school debating society (Fisch: personal communication). As an undergraduate at Harvard, Peirce continued to cultivate an interest in elocution, rhetoric, and theatrical performance. He became a member, in his junior year, of the W.T.K. (Wen Tchang Koun, Chinese for "hall of literary exercise"), which specialized in debates, orations, mock trials, and the reading of essays, poems, and plays. During his senior year, in 1858, he was a founding member of the O.K. Society of Harvard College, which pursued the elocutionary and oratorical arts in relation to literary works (Kloesel: personal communication; cf. Kloesel 1979). As an adult, Peirce was known to have given readings of Shakespeare's *King Lear* to friends, at his older brother "Jem's" house in Cambridge, and to fellow members of the Century Club, in New York. Peirce attended the theater and the opera when in Paris, and his second wife, Juliette, was an actress. He and Juliette remained in contact with theatrical friends, such as Steele and Mary MacKaye, and even occasionally took part in amateur theatrical events, such as a performance of Legouvés's *Medea*, which Peirce had translated into English (Fisch: personal communication).

"The stage lost a fine actor," writes Watson of Holmes, in *A Scandal in Bohemia*, "even as science lost an acute reasoner, when he became a specialist in crime." To some extent, the dramatic way in which Holmes displays his logical operations is akin to the manner in which some physicians seek to impress their patients as to their seemingly magical powers of diagnosis, thereby developing a feeling of confidence on the part of the patient that will contribute to the healing process.

Ritual trappings in clinical practice constitute the essential ingredient of the placebo effect (see Sebeok 1979: chaps. 5 and 10). The placebo is thought to be efficacious because the patient believes that it will be, a belief that is bolstered by appropriate cueing on the part of the physician and other attendant personnel, as well as shaped by the context in which the placebo is administered.¹² Some psychologists, such as Karl Scheibe, employ the term *acumen* for a mode of prediction exhibited by Holmes, constituting "an emphatic skill combined with analytic precision." Scheibe observes:

If one believes oneself to be at a disadvantage vis-à-vis the terrible but well-controlled powers of observation and inference of the . . . detective . . . then one has in effect granted authority to a superior and has no hope of mastering events. . . . To the extent that the . . . detective is considered by the public at large to possess special powers of penetration, the powers of acumen of these practitioners will be enhanced. Also, to the extent that any player is able to exploit the naiveté or credulity of the other player about innocence of intent, the second player is effectively under control of the first. This is the basic principle for the confidence game. [1978: 872-875]

A similar con game is played out between the author of a detective story and his audience, of course. Conan Doyle acknowledged this both indirectly, through the character of Sherlock Holmes, and directly, in his autobiography. In *The Crooked Man*, for instance, Holmes tells Watson:

It is one of those instances where the reasoner can produce an effect which seems remarkable to his neighbour, because the latter has missed the one little point which is the basis of the deduction. The same may be said, my dear fellow, for the effect of some of these little sketches of yours, which is entirely meretricious, depending as it does upon your retaining in your own hands some factors in the problem which are never imparted to the reader.

In his autobiography, Conan Doyle, discussing the composition of a detective story, writes: "The first thing is to get your idea. Having got that key one's next task is to conceal it and lay emphasis upon everything which can make for a different explanation" (1924:101). Holmes himself enjoyed taunting official detectives by deliberately pointing out clues without indicating their significance (*The Boscombe Valley Mystery*, *The Cardboard Box*, *The Sign of Four*, *Silver Blaze*).

Joseph Bell himself refers to this type of psychological manipulation as follows:

The recognition [of disease] depends in great measure on the accurate and rapid appreciation of small points in which the disease differs from the healthy state. In fact, the student must be taught to observe. To interest him in this kind of work we teachers find it useful to show the student how much a trained use of observation can discover in ordinary matters such as the previous history, nationality and occupation of a patient. *The patient, too, is likely to be impressed by your ability to cure him in the future if he sees that you, at a glance, know much of his past. And the whole trick is much easier than it appears at first.* [Trevor Hall 1978:83; emphasis ours]

Holmes frequently opens his initial interview with a prospective client with a stunning series of "deductions," much as Bell describes, and these "clever little deductions . . . often have nothing to do with the matter in

hand, but impress the reader with a general sense of power. The same effect is gained by his offhand allusion to other cases" (1924:101-102).

And who among us has not been intimidated by a related interview technique used on us by our own doctor, when he asks us a series of seemingly unrelated questions (e.g., Have you been smoking heavily lately? Does it hurt only at night? Has your mother ever suffered from headaches?), upon the termination of which he may suddenly announce his diagnosis, a pronouncement that appears to us, being unable to judge the significance of each separate clue, and hence the logicity of the sequence of questioning, as nothing short of numinous. If the physician has already guessed at a diagnosis, but has not announced it to the patient, the questions which he uses to test his hypothesis will appear to the patient almost as an exercise in extrasensory perception (e.g., You have this sensation only one and a half hours after eating, and it is accompanied by a throbbing pain in your right arm? Why yes, how did you know?).

While guessing is an important part of all logical operations, as Peirce taught us, the typical patient might be expected to lose confidence in his doctor were he to learn the amount of guesswork that goes into medical diagnosis and treatment, so that physicians are more or less obliged to cover up this aspect of their practice, much as Sherlock Holmes is in order to build up his reputation as a master detective. As in the example just discussed, physicians do so by so-to-speak mystifying the client through the intentional obfuscation of the reasoning process, making questions appear as deductions, by simply acting as if a diagnosis had been arrived at through deduction and induction, without a preceding abduction, or by appearing to understand our innermost thoughts and feelings without the intermediary of signs given off by the patient.

The importance of such tricks for Holmes's reputation is brought out in the following passage from *The Red-Headed League*, where the detective is interviewing a Mr. Jabez Wilson. Holmes announces his startlingly accurate conclusion as to Mr. Wilson's background and lifestyle, at which point Mr. Wilson "started up in his chair" and asked "How, in the name of good fortune, did you know all that Mr. Holmes?"

"How did you know for example, that I did manual labour? It's as true as gospel, for I began as a ship's carpenter."

"Your hands, my dear sir. Your right hand is quite a size larger than your left. You have worked with it, and the muscles are more developed."

"Well, the snuff, then, and the Freemasonry?"

"I won't insult your intelligence by telling you how I read that, especially as, rather against the strict rules of your order, you use an arc-and-compass breast pin."

"Ah, of course, I forgot that. But the writing?"

"What else can be indicated by that right cuff so very shiny for five inches, and the left one with the smooth patch near the elbow where you rest it upon the desk?"

"Well, but China?"

"The fish that you have tattooed immediately above your right wrist could only have been done in China. I have made a small study of tattoo marks and even contributed to the literature of the subject. That trick of staining the fishes' scales of a delicate pink is quite peculiar to China. When, in addition, I see a Chinese coin hanging from your watch-chain, the matter becomes even more simple."

Mr. Jabez Wilson laughed heavily. "Well, I never!" said he. "I thought at first that you had done something clever, but I see that there was nothing in it, after all."

"I begin to think, Watson," said Holmes, "that I made a mistake in explaining. *Omne ignotum pro magnifico*, you know, and my poor little reputation, such as it is, will suffer shipwreck if I am so candid."

Or again, in *The Stock-broker's Clerk*, Holmes remarks that "I am afraid that I rather give myself away when I explain. . . . Results without causes are much more impressive." Holmes is less than completely candid when he says to a client, in *The Reigate Puzzle*, "I am afraid that my explanation may disillusion you, but it has always been my habit to hide none of my methods, either from my friend Watson or from anyone who might take an intelligent interest in them."

THAUMATURGY IN FACT AND FICTION

The juxtaposition of the method of Charles Peirce, detective, with the method of Sherlock Holmes, semiotician, which began as a *jeu d'esprit*, ends by shedding unexpected light on both the historical figure and the fictional one. From the perspective of the great logician and polymath, Holmes's Science of Deduction and Analysis, set forth comprehensively in his "The Book of Life" (*A Study in Scarlet*), where the "writer claimed by a momentary expression, a twitch of a muscle or glance of an eye, to fathom a man's inmost thoughts," are seen as far from the "ineffable twaddle" or "rubbish" that Watson at first thought they were. The theories that Holmes expressed in the article, which appeared to his Boswell "so chimerical, are really extremely practical," and his projected one-volume textbook on the "whole art of detection" (*The Abbey Grange*), to which he had planned to "devote [his] declining years," assumes a contextual rationale in the history of ideas, based, partly as it is, partly as it might have been, on a "mixture of imagination and reality" (*The Problem of Thor Bridge*) and the judicious exercise of speculation as "the scientific use of imagination" (*The Hound of the Baskervilles*).

Holmes was a brilliant physician to the body politic, the disease of which is crime. As in the adventure of *The Creeping Man*, he speaks of his cases "with the air of a pathologist who presents a rare specimen." Holmes was pleased that Watson had chosen to chronicle those incidents that gave room for deduction and logical synthesis. While he maintained, in *A Study in Scarlet*, that "all life is a great chain, the nature of which is

known whenever we are shown a single link of it," he also held that his conclusions from one to the other "were as infallible as so many propositions of Euclid. So startling would his results appear to the uninitiated that until they learned the processes by which he had arrived at them they might well consider him as a necromancer."

Peirce was, in his way, as great a necromancer as Holmes, and that is why his writings and the details of his biography keep us all spellbound. He was, according to Charles Morris's both weighty and accurate characterization (1971:337), "heir of the whole historical philosophical analysis of signs. . . ." Peirce represents the tallest peak so far in the mountain range that begins to rise in ancient Greece with the clinical semiotics of Hippocrates, is more fully as well as more explicitly developed by Galen (Sebeok 1979: chap. 1), and continues with the physician Locke, whose *semiotiké* Peirce "distinctly weighed, and duly considered" and which surely afforded "another sort of Logick and Critick, than what we have been hitherto acquainted with" (Locke 1975:721).

It is one thing to proclaim—as we do—the continuity and cumulative effect of this panorama, extending from archaic medical diagnosis and prognostics to the modern expressions of a doctrine of signs by Peirce and beyond, on the part of such modern virtuosos as the Baltic biologist Jakob von Uexküll (1864-1944), and the French mathematician René Thom (born 1923). To document it is quite another. The proof will take at least one more generation of concentrated effort by teams of knowledgeable specialists in the labyrinthine history of the sign science (cf. Pelc 1977), only the barest outlines of which have hitherto been delineated by those few explorers who are equipped to follow upon the clues laid bare by Peirce, so far the boldest pioneer, or backwoodsman, in this high adventure.¹³

NOTES

1. ". . . Abduction is, after all, nothing but guessing," he wrote elsewhere (*Collected Papers* 7:219; cf. Ms. 692). Compare Noam Chomsky's explicatory remarks, in relation to abduction, concerning "the philosopher to whom [he feels] closest": "Peirce argued that to account for the growth of knowledge, one must assume that 'man's mind has a natural adaptation to imagining correct theories of some kinds,' some principle of 'abduction' which 'puts a limit on admissible hypothesis,' a kind of 'instinct,' developed in the course of evolution. Peirce's ideas on abduction were rather vague, and his suggestion that biologically given structure plays a basic role in the selection of scientific hypotheses seems to have had very little influence. To my knowledge, almost no one has tried to develop these ideas further, although similar notions have been developed independently on various occasions" (Chomsky 1979:71).

2. On the notion of "*lumière naturelle*" see Ayim 1974:4374.

3. Holmes, alas, never said that. He never said "Elementary, my dear Watson" either.

4. Martin Gardner describes this process as follows: "Like the scientist trying to solve a mystery of nature, Holmes first gathered all the evidence he could that was relevant to his problem. At times, he performed experiments to obtain fresh data. He then surveyed the total evidence in the light of his vast knowledge of crime, and/or sciences relevant to crime, to arrive at the most probable hypothesis. Deductions were made from the hypothesis; then the theory was further tested against new evidence, revised if need be, until finally the truth emerged with a probability close to certainty" (Gardner 1976:125).

5. Examples of this from Persi Diaconis and a performer who goes under the name of Kreskin (George Kresge, Jr.) are cited by Sebeok (1979:93). These cases bear an uncanny resemblance to Peirce's story of his watch. Diaconis, besides being one of the most talented of contemporary magicians, is also among the foremost experts in the sophisticated statistical analysis of guessing and gambling strategies, and in applying novel techniques in parapsychological research—with hitherto totally negative results (see Diaconis 1978:136). Yuri K. Scheglov's observation about the growth of tension and excitement as Holmes's logical reasoning gradually "creeps up on the criminal and lifts a corner of the curtain (we have here much the same effect as in the children's game 'Cold or hot' in which the area for hunting narrows down and gets 'hotter and hotter')" should also be mentioned in this connection (Scheglov 1975:63).

6. Two Holmes stories, by the way, feature detectives from the Pinkerton National Detective Agency: Young Leverton, who has a minor role in *The Red Circle*, and Birdy Edwards, alias John ("Jack") McMurdo, alias John ("Jack") Douglas, who was probably tossed overboard off St. Helena by the Moriarty gang at the conclusion of *The Valley of Fear*.

7. An interesting parallel is found in Voltaire's *Zadig* (chap. 3), where Zadig's clever reading of clues causes him to be arrested, tried, and fined. There is a considerable body of secondary literature on Holmes and Zadig.

8. As Stephen Jay Gould recently confirmed, in reference to the academic world in general, "unconscious or dimly perceived finagling, doctoring, and massaging [of data] are rampant, endemic, and unavoidable in a profession that awards status and power for clean and unambiguous discovery" (1978:504). In brief, such manipulation of data may be a scientific norm.

9. On this point, see also Messac, as well as Hitchings.

10. On the significance of windows in the Sherlock Holmes stories and the works of Jules Verne, see chapter 3 of this volume.

11. Describing Holmes's knowledge of various subject matters, Watson lists only one—chemistry—as "profound" (*A Study in Scarlet*). On Holmes as "a frustrated chemist," see Cooper (1976:67-73).

12. For a sound, popular account by a surgeon of the workings of the placebo effect by "healers," and the power of suggestion, including sometimes hypnosis, see Nolen 1974.

13. Advances are being made, however. See the collaborative *Encyclopedic Dictionary of Semiotics*, being prepared under the guidance of a multinational editorial board (Bloomington: Indiana University Press, forthcoming).

Captain Nemo's Porthole¹

Whoever wants to describe a window will do it well only if he also describes the view beyond, the view of which that window is, as it were, a framework.

—Kotarbinski 1966:514

NORDON (1966:22-23), in his standard biography of Conan Doyle, reports that in the summer of 1873 the fourteen-year-old boy, who was to become the creator of Sherlock Holmes and of Professor George Edward Challenger, became "possessed of a sudden passion for the French language, which he studied by reading Jules Verne." He read *Vingt mille lieues sous les mers* (1870), *Cinq semaines en ballon* (1863), *De la terre à la lune* (1865), and *Aventures de trois Russes et de trois Anglais* (1872), and, according to his biographer, he "soon began to find it easy to slip from one language into the other." As Doyle wrote to his mother in June of that year: "I am getting to relish [the Verne novels] quite as well as English books" (Nordon 1966:21f.). It was also about this time that he began to realize that he had certain literary gifts of his own. Nordon (*ibid.*:82) confirms that, except for works by Jean Froissart, the fourteenth-century chronicler, those of Verne "were among the first [French] books Conan Doyle read," although he later read a great many others throughout his life.

In *Through the Magic Door* (1923:118, 255), Doyle refers twice to Verne. He remarks that "all pseudo-scientific Verne-and-Wells stories have their prototypes in 'Voyage to the Moon,' . . ." and that Verne, like Poe, "also produces a charmingly credible effect for the most incredible things by an adept use of a considerable amount of real knowledge of nature." Not until 1912, says Nordon (1966:328), does "Conan Doyle emerge as one of Jules Verne's most talented disciples," referring, of course, to the publication of *The Lost World*, a detective story of sorts, which Higham (1978:109, 210) called "a masterpiece of imaginative fiction, reminiscent of Jules Verne but not suffering from the comparison."

¹This article, written in collaboration with Harriet Margolis, is also slated to appear, with some modifications, in *Poetics Today* 3 (1981-82). That publication will include six tables summarizing information about the use of windows throughout the entire canon.