class 8

Family/Disease/Treatment Systems: A Coevolutionary Model

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". . . this paper is not an attack on medical science but a demonstration of an inevitable fact: that mere purposive rationality unaided by such phenomena as art, religion, dream, and the like, is necessarily pathogenic and destructive of life; and that its virulence springs specifically from the circumstance that life depends upon interlocking circuits *of contingency, while consciousness can only see such short arcs of such circuits as human purpose may direct."*

Gregory Bateson (4, p. 146)

This article originated in an effort to develop a model for relating two classes of events: illness events and family-systems events.

The first focus of the article was on the coevolution of disease pattern and family pattern. This led to a reconsideration of the concept of context, as well as what is meant by the term "family." Borrowing from others, who will be cited below, this exploration ultimately led to a consideration of a construct: the problem-generated or problem-defined system. This construct subsumes family and all other elements that are involved in maintaining or disequilibrating the patterns under consideration—a disease pattern or family pattern in the present instance.

The main concern of this article is to present the coevolutionary perspective: how an entity and its context evolve together, shape and stabilize each other. Throughout, medical and psychiatric conditions are used as case examples; we will consider a wide variety of such conditions: the abdominal pain syndrome in children, postpartum depression, cervical cancer, nonorganic paralyses in children, among others. The systemic perspective of the article should make clear that in none of these instances are we talking about the cause or etiology of any of these syndromes.

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We will consider a disease event to be any physical or behavioral pattern considered by the person exhibiting it, or by others, to be a sign of sickness or disease. As lawyers would have it, we stipulate the existence of a large number of personal and cultural conditions under which such a judgment is made and identify them as the proper subject for empirical research; such research is not currently our concern.

The connections between etiology, illness, and treatment appear to be self-evident but only when *punctuated* in a very special fashion. The essential features of that punctuation are:

1) the restriction of contextual information;
2) the ordering of relational (causal) sequences in lineal fashion over *short* time periods with the arrow of time pointing in one direction only;
3) the elimination of the observer or the observing system from the field of inquiry.

For 400 years this has been the ruling scientific paradigm, the road to "objective truth." From around the turn of the century, first in physics and more recently in biology and elsewhere in science, this governing paradigm has been challenged. As with the Newtonian revolution, the adaptation to and incorporation of the systemic paradigm has been difficult and uneven. Nor is it suitable for all purposes—far from it (5).

The persistent and unprecedented interest of family therapy in epistemology is worth a moment of attention. Of all the clinical specialties family therapy has been most hospitable to and intrigued by the possibilities associated with these newer systemic paradigms. This has been generated from the very beginning of the field by concern with the family as something other than, and more than, a collection of individuals. When pioneer family therapists turned their attention to the intriguing question, "How would the rules, roles, structures and functions, history, and organization of the family explain the observable behavior of its members without recourse to individual psychological or motivational explanations?", they looked to systems theorists to provide paradigms.

The most influential metatheorists in the early days of the development of the family-therapy field were Norbert Wiener, the cybernetician; Ludwig von Bertalanffy, the theoretical biologist who founded General Systems Theory; and Gregory Bateson, the anthropologist. Our present interest is in health issues and biomedicine, where the great complexities of events, their multilevel nature (molecular, cell, tissue, organ, organ system, organism, interpersonal field, family, community, and society), calls for new paradigms other than those of classical Newtonian science. Thus, this article, drawing principally on cybernetics and general systems theory for its language, is an attempt to describe disease/treatment as a *microevolutionary* event.

"What is the illness?" is a question that often appears simple to answer

and is at other times bewilderingly complex. The knife slips, there is a small cut, a bandage is applied, healing takes place. All is as it was before. Or is it? Is there a tiny scar? No matter. But it's on the face. Still no matter. But she's a young girl. Ah! Well then. Too little context has been provided for the story to be satisfying.

On occasion we sense that "something is wrong with the story": the wound fails to heal or we hear that "this is the third accident he has had this month." In these instances we might have the disturbing feeling that the boundaries of the phenomenon were incorrectly drawn, not sufficiently inclusive. The correct boundaries in time/space do not inhere to the events, which after all are chosen (languaged) by the storyteller; rather we choose what story to tell by our purposes and relation to it. The emergency-room team, the police investigators, and the psychiatrist all elicit and tell different stories about a stab wound. More elegantly, it can be said that they construct different realities.

Once again, what is illness? How are we to define its extensions in space/time? From the perspective of this paper, we would, in the words of Auerswald (2), take the "initial role of a nonblaming ecological detective. The initial task, in this context, is to seek out and identify the *ecological event shape* [italics added] in time/space that includes the situation that led the family to issue a distress call."

I take the term ecological event shape to describe a *virtual* space, which is the universe of all possible elements that could be included in the problem-defined system. It is infinite and unknowable—out there, as it were, where mystery resides. Partial knowing, through language, is the activity of the nonblaming ecological detective, which leads to the construction of one among many possible realities: the problem-generated or problem-defined system.

The problem-defined system (corresponding to the term "situation" in the Auerswald definition above) is a language event. It lies within the space of the event/shape, always includes the observing system, and is to be parsimoniously defined. Parsimony is important; the universe is infinite.

Our general approach is to include in the story only (all of) those elements that 1) stabilize the problem or 2) disequilibrate its preceding systems. This requires us to include in the story only (all of) those elements that are involved in observing and changing (disequilibrating) the problem, for example infection, injury, treatment, and so on. In the accounts of clinical syndromes that follow, one may differ with interpretations of details; the reader is urged to (mostly) listen to the music rather than to the words.

Clinical Stories

Let me begin with a tale that is familiar in many of its elements to all pediatricians and to some family therapists: the abdominal pain syndrome

in children. The physical syndrome is a chronic condition of obscure etiology characterized by recurrent episodes of abdominal pain, flatulence, and mild diarrhea for which no organic cause can be found. The youngsters are frequently seized with abdominal pain that is serious enough for them to stay out of school; there are frequent visits to the pediatrician. Extensive diagnostic procedures are often carried out, including endoscopy and even surgical exploration. Diet and medication and individual or family psychotherapy are often prescribed; the results are often ambiguous.

The story can be told this way: It begins with a *random disequilibrating event*. There is some gas in the child's gut and a moment of coliclike abdominal pain ensues. At the same time there is a relationship configuration in the child's family for which this random event has *meaning*: as an oversimplified example, the parents are covertly at war and the mother, in the context of this undeclared war, moves closer to a potential ally, the child, around the issue of the moment of abdominal pain.

Over time, in many of these situations a physician, in the effort to assist the over-involved parent (more commonly the mother) with the worrisome problem of her child's gut, will become increasingly involved and increasingly frustrated. Out of the physician's desire to help, another shift in the relational geometry will take place, bringing the physician closer to the mother, which may further stabilize this particular system. The relational geometry of the family *and* the health-care system is thereby changed.

We may imagine that the distance between mother and father increases as the father attacks the increasingly close alliance between mother and child ("All you do is baby him for every little ache and pain"). As part of this process, the father withdraws further, perhaps making a tie to an ally, such as work or a woman friend, outside the family (I'll be at the office working late tonight"), or within the family by teaming up with a second sibling. The relational geometry of the family, of the mother, father, child triangle, is thereby changed; a new family/disease/treatment system has come into being.

It seems evident that it is inappropriate to talk about cause or etiology using this model. Indeed, the random event of the moment of colic might be considered, via the loops indicated here, to be the cause of its own existence (tautology).

In the language of biological evolution we could say that the target pattern (in this case the illness pattern) modifies its context (in this case the family/physician relational pattern) to create an ecological niche that supports it. Elsewhere I have referred to this as *portable reality* (6). It is, of course, equally true to say that the family/physician relational pattern modifies the illness pattern. The choice of which pattern is to be considered the target and which is considered to be context rests with the *purposes* (3) of the observing system.

The loop whereby a pattern modifies its surround to produce the conditions for maintaining its own existence obviously need not involve the

psychosocial level at all. The purposes and available language of the observer will determine the level at which the target phenomena are to be described. An example from virology will illustrate (7).

In a recent review article the following thesis is developed:

> the future of medical virology will probably relate far more to persistent viral infections and the diseases associated with them. Included within this group are many of the herpes viruses . . . hepatitis B virus, human T-cell lymphotropic virus (HTLV) Types I, II, and III. . . . Such viruses may not kill the host cell in which they replicate . . . and may not generate immune responses that are effective in clearing the viruses (7).

The authors note that the host immune response acts by the route of antiviral antibodies and cytotoxic lymphocytes that act by "directly injuring cells displaying viral antibodies." This process, which is characteristic of *acute* infections, does not operate in the same way in persistent infections. The viral infection need not kill the host cell but can transform it by a number of mechanisms so the host cell survives (indeed can be induced to reproduce the viral DNA along with its own) but has an altered function, whence comes the disease associated with that particular virus. "Viruses can also change the differentiated functions of immunocompetent cells required for viral elimination, and this may be of major importance to the establishment of persistent infections."

To rephrase in the language being used in this article, these persistent viruses persist by changing the characteristics of their contexts. Thus, the acute becomes chronic.

A second example at the physiological level can be found in the following discussion in "Tumors: Wounds That Do Not Heal" (7). "An appreciation of tumor stroma (the connective tissue and blood vessel supporting structures) is essential to the understanding of the biology of tumor growth; all solid tumors, regardless of their site of origin, require stroma if they are to grow beyond a minimal size of one to two millimeters." Stroma "provides the vascular supply that tumors require for nourishment, gas exchange, and waste disposal" as well as being able "to limit the influx of inflammatory cells, thus providing a barrier to immunological rejection."

The author goes on to "present evidence that tumors behave in the body like wounds, and, in fact, *induce their stroma by activating the host wound-healing response* [italics added]." I will suggest that tumor-stroma generation is wound healing gone awry.

> Viewing wound healing as a paradigm for the generation of tumor stroma makes considerable biologic sense. Without linking tumor stroma generation to *some fundamental host process* [italics added], one is forced to assume that the body responds to tumors with a unique

> mechanism, some *deus ex machina* whose sole function is to generate tumor stroma. . . .
>
> They have developed the capacity to preempt and subvert the wound healing response of the host as a means to acquire the stroma they need to grow and expand. . . . Thus, tumors appear to the host in the guise of wounds, or more correctly, an unending series of wounds that continually initiate healing but never heal completely (7).

(As an aside, your attention is drawn to the novelistic terms the author uses: preempt, subvert, acquire, in the guise of.) In this example we are confronted with the fashion in which a "normal" reparative process, wound healing, is recruited into providing the supportive structures without which the cancer could not survive.

Kraus and Redman (8) offer a strikingly similar view of postpartum depression:

> The new mother and others have inadvertently coevolved a social system which neither desired. . . . These stages in the evolution of postpartum depression . . . are based on a deviation-amplifying feedback model in which serious problems develop from well-intended attempts at solving normal, everyday difficulties. . . . postpartum depression begins with the developmental crisis of pregnancy and childbirth . . . [further changes] occur when the husband and others switch from empathy for the new mother to frustration and irritation . . . and try to avoid aversive complaining by offering false reassurances. [A full-scale depressive system evolves] when the husband and other family members can no longer tolerate the new mother's immutable depression and so exclude her from meaningful relations.

The "normal" short-lived postpartum depression, which is in all likelihood hormonally induced, can blossom in the favorable environment of certain family structures by inducing changes in those structures. These induced changes support the continued coevolution and change of both the structures *and* the depressive behavioral pattern. The acute becomes chronic. The authors note how a set of therapeutic interventions that depend on interrupting these circularities can be designed.

The clinical story by its very nature involves more than one systems level (Engel's biopsychosocial model). We assume that the distinction of a systems level is a language event; the language in use will have its more-or-less consistent rules for how levels are to be delimited. (This delimitation is both a scientific and a political act.)

Time boundaries of the clinical story must be decided on as well. The decision about which time frame to use is a critical factor in story construction. The rate of change at a systems level is a significant factor and must also be taken into account. For example, slow-moving biological events (a

genetic disorder) introduce a fateful warp to the family destiny and provide the (relatively) immutable backdrop against which other dramas play themselves out.

In language we shall use later in this essay, the stored experience of relationship becomes the template on which future experience is modeled. Repetition *over time* is essential to this process of replication; the earlier and more frequently a pattern occurs, the greater the chance it will be replicated in the future. *The power of the earlier event exists because the stored pattern organizes the meaning of new experience on a moment-by-moment basis.*

I would like to report now on a study that touches on the subject of description of family/disease/treatment phenomena at multiple systems levels. At issue here is the *isomorphism* of patterns at two different system levels. In this instance an entire drug-treatment social system has the characteristic pattern of the addict's family, thereby stabilizing the addictive pattern, the addict's family, and the institutional relational pattern as well.

This concept is central to the notion of coevolution. Here is the problem: If we track events at two or more different levels of organization, let us say, a tissue level and a family level, or a family level and a social-organization level, and those events seem to have patterns that are congruent with each other, have the same shape, that is are iso (same) morphic (shaped), how are we to interpret our observations? It is up to us to define the system boundary, and we are free to regard an organized pattern at one level as a system. If we do so, we can think of a pattern at one level providing a template, a guide to the replication of a pattern, to the organization at another level. On the road to stabilizing we would think of the pattern at each level as determining and being determined by the pattern at the other. In other words, as they become increasingly isomorphic, they coevolve.

Our example concerns the treatment of heroin addictions. Three different systems levels are involved in this story: the addict's family, the treating health-care system, and the community. Of particular interest to us at this point is the isomorphism of the addict's family and the treating agencies. The research being reported here was carried out by John Swartzman in Chicago (16). As a consultant to a network of centers treating heroin addicts, he delineated the following pattern.

The typical addiction treatment center (part of a network of three) was staffed by paraprofessional counselors, most often former addicts, who were considered to be street- and drug-wise, by nonaddict nurses who dispense medication, and by physician directors. To simplify Swartzman's detailed account, there is always the potential for conflict between these groups. At stake is control over the availability and dosage of methadone, the addictive but noneuphoric medication dispensed to prevent withdrawal symptoms, which is highly desired by the addicts. The counselors are in the position of having to demonstrate their superior knowledge of addict life by maintaining close ties with the patients. This involves condoning "cheating" when

urine tests are not "clean," that is, when the tests reveal drug use. This puts them at odds with the "straight" physicians, with whom they are already engaged in class and often ethnic conflicts, since the counselors are most often lower class and black. The different economic situation of the two groups adds fuel to the fire, as does administrative confusion. For example, career lines for counselors are less available, which restricts upward mobility. Of principal importance is the fact that it is impossible under these conditions to develop the consistent limit-setting stance required for treatment. Excuses are constantly being made, agreements breached, laws of the therapeutic community violated. The division and conflict of those in authority is reflected in the continued drug use by the addicts.

The pattern is isomorphic with that of the typical addict family, where one parent is seductively enmeshed with the patient and the other is isolated or rendered powerless by the dyad. It is as difficult to develop a consistent pattern of limit-setting in the family as it is in the treatment setting.

> The basic premises of those involved create and maintain social systems which are analogues to the families of clients and to the individual methadone clinics. The dissonances in ideology, status of paraprofessionals, clinic professionals, medical personnel, and beliefs about addiction create more and more inclusive analogues to the addict's family: intrusive, pseudo-constraining, covertly conflictual, and lacking clear transitions. This system is maintained by a flow of clients and staff among clinics, and makes treatment primarily a function of the contingencies of the more inclusive social system (14, p. 354).

It is useful to review an investigation where a sequence of events is studied that includes a situation where the changes at one systems level may exceed the available contingencies at another, and therefore, in some instances smooth coevolution cannot occur. The pilot study reported here is elegant in that it is prospective. Velasco de Parra (17) studied families in which one member is a candidate for a kidney transplant. Before knowledge of the results of immunological studies done to determine tissue compatibility, the investigator did structural studies of the family in the manner of Minuchin (11). The family coalitions, splits, and subsystems were determined. Did mother and child-patient have a close or distant relationship? How was the sibling group organized? What dyads were overly close or overly distant?

Researchers reasoned that the psychosocial effect of an organ donation, a kidney in this instance, was to bring the two family members closer together. Based on this reasoning, predictions were made that depended on which dyad would be so involved. This dyadic change could be or not be isomorphic with the preexisting structures and this was consequential. If two people who had already been quite close were brought closer together there were no problems. On the other hand, if the two who were brought closer together had been quite distant from each other, or were pulled out

of another close dyadic tie, there was an increase in distress and symptomatic behavior.

The clinical story teller's choice of *time frames* and treatment of time is of paramount importance. Writing on gynecological cancer, Labrum (9) presents a vivid description that is relevant to our thesis. Recent demonstrations of the neuroendocrine and immunological links to cancer make his writings seem even more prescient. I will abstract one section of his paper: "Factors other than some coitally transmitted agent must determine which women develop cancer. The epidemiological associations of early onset, multiple sex partners and separation or divorce need to be reinterpreted." He notes the various studies indicating the connection between hopelessness and certain life patterns and cervical cancer. In a comparison of 100 women with cervical cancer and 100 women with other forms of cancer, it was noted that those with cervical cancer showed a "dislike of sexual intercourse, reduced frequency of orgasm, a history of leukorrhea, a tendency to marry alcoholics, and a high incidence of divorce."

In a passage that exemplifies Auerswald's injunction to be a "nonblaming ecological detective," Labrum takes us to the heart of the matter:

> The woman most at risk grows up in a home with parental unemployment, poverty, absent parent(s), parental abuse, and inadequate love . . . the occurrence of sexual intercourse in young teenagers is the price she is willing to pay for a "loving" relationship. She usually does not enjoy the physical aspects of sex . . . and often has a series of brief sexual relationships in which she is looking, with increasing despair, for someone who will provide for her own (often enormous) needs. At some point she gives up . . . [and] as a teenager or young adult she finds herself separated or divorced (sometimes several times) and in a state of hopelessness. She will almost certainly have become infected with herpes virus II, possibly with other transmissable oncogenic factors or cofactors such as chronic trichomonal infections and, I believe, in this setting cervical changes occur, which progress if untreated through the dysplasias to carcinoma in situ and then to invasive cancer. *It is possible that in such high risk women changes occur very rapidly* [italics added] (13, p. 818).

"To fit the theory being developed," Labrum comments, "immunologic variations would necessarily have to be under central control. . . ," a view, we may add, with much stronger support today than when initially proposed by Labrum.

If the full play of imagination is allowed to come to bear on this story, we are led into truly uncharted plains. It is not that we are hard-pressed to answer such questions as "What is the etiology of cervical cancer?" Rather the questions are seen to be from another paradigmatic world. We peer through the mists and address ourselves to strange new questions such as:

What elements should be included in the problem-generated system, one element of which is cervical cancer? How do these elements coevolve?

Our next example deals with a quite different clinical syndrome. Both accounts are, however, strikingly similar in that a multigenerational structure and a particular relation to the larger culture are necessary for the final clinical picture to evolve. The Norwegian clinician-researcher Wencke Seltzer (14), in an effort to understand and develop a rational treatment approach to certain highly resistant conversion disorders in children, extends her perspective to include the national culture as well as the changing multigenerational culture in the children's families.

The children come to clinical attention with crippling sensory-motor disorders for which no organic problem can be found despite extensive and repeated investigations. Milder psychosomatic conditions such as "more diffuse conditions such as abdominal pain, backache, headache, and muscle/joint pain . . . were excluded." To oversimplify the author's elegant conceptual structure is distressing but necessitated by space limitations. These children grow up in low-status families that have been scorned and isolated by Norwegian society in the past. The grandparental families were commonly of the rural lumpen proletariat, although with mothers of slightly higher status than the fathers. The parental generation valiantly struggled against the oppressive and stigmatizing past by self-discipline, religious fundamentalism, sports involvement, physical action, and exertion.

These are families with "a heritage of damaged goods"; conformity, both within and outside the family, is their protective watchword. A feature of this evolving pattern over the generations consisted in overestimating the essentially mediocre intellectual capabilities of the child who is to become physically ill. Thus, "when the time approached for the children—particularly the youngest—to leave, the spousal unit was severely threatened. The question as to its future survival abruptly arose. Alternative solutions, such as work or other engagements outside the home for the mother, had been too long associated with negative morality to appear workable" (14, p. 278). At this point symptoms such as severe paralyses began to appear in the child.

DISCUSSION

We will attempt to identify as well some of the elements that make for the "goodness" of these clinical stories. It should be possible to describe each family/disease/treatment situation in regard to these dimensions.

How should a system and its context be demarcated from all else? How should systems be demarcated from each other? And how should they be connected to each other? This, in fact, constitutes a single question that acknowledges two kinds of distinctions: between what is within a system and outside of it and between the components that make up a system. "Environment," "context," and "surround" are expressions of a particular location from which a scene is viewed. (Gertrude Stein may be quoted on

this subject. She was asked, it is said, on the occasion of viewing a distant California scene, if she was "born over there." Her reply: "There is no 'there' over there.") What we choose to call context is arbitrary. The disease in the body-as-context reflects our viewing stance: a virus-eyed view would be quite different.

The terms "family" and "family system" are used to denote many different things. In the early days of family therapy a common language definition was considered acceptable, although the difficulty in knowing the *time frame* being used was disturbing—difficulties that persist to this day. For example, was family of origin presented as it had existed, or was it the current representation (representation where? in someone's mind? in the family relational organization?) of the family of origin, or the current actuality (according to whom?) of the family of origin that was being alluded to when one spoke of "family"? That difficulty was complicated in different ways in speaking of the current or contemporary family. Whom to include was unclear. According to what rules did one construct something called "the family"? Did one speak of biological, legal, or emotional definitions? How were partial units, such as sibling subsets or a marital pair, to be spoken of? What about kin extensions and multigenerational units, to say nothing of lovers, ex-mates, and children of new mates?

In addition, it has been necessary over the last decade at least to take into account other clearly nonfamily social structures in regard to the development and maintenance of less-than-interesting, i.e., problematic, patterns. For example, it is a part of conventional systemic wisdom that the health-care system is frequently an active stabilizer of malfunctional patterns, and that sophisticated psychotherapists routinely consider the "iatrogenic" effects of their own interventions. Several examples of this will be provided, ranging from the simple instance of pediatric involvement in the development of the abdominal pain syndrome in children, to the picture of clinic involvement in maintaining methadone addiction in its clients.

Clearly we have gone way beyond common language definitions of family here, yet some version of this concept is, I believe, central to our understanding. In regard to what is distinctively human functioning, "family," i.e., some versions of the intimate networks of past and present alluded to above, are ever-present as organizing structures among the social systems. There is a tendency among some current theorists to discard family entirely. An interesting and important presentation of this and associated concepts can be found in Anderson, Goolishian, and Winderman (1). They say "... there are no set facts about family, family theory, or family therapy that are independent of our observations or our mode of engagement. There is no single objective reality about a family and its problem waiting to be discovered. There are multiverses, each valid in its own right." This is a point of view with which I agree, although I would point out that a shared language about "our observations [and] our mode of engagement" is what we mean by "family" and is our ticket of admission to the human race.

Peggy Penn can be quoted on this subject:

> I understand the epistemology of the organization we call "family" as closely following Bateson's construct of a "pattern through time," meaning that members of a family form relationships with one another over the generations and these relationships are specific patterns identifiable to that family . . . if we regard time as ongoing process, then each pattern is known to its members as a sum of the past in the present, and that sum amounts to an identifiable stance in their social realm: we are, we did, we show, we felt, we know, etc. Continuation, perseverance, and familiarity of their pattern are the expectations families hold of their future together . . . (12, p. 16).

Which elements of family belong in the problem-generated system, and the part the system plays in the relation of those elements to each other, are decisions to be made at the particular story (case) level. It is a function of the particular problem and the particular treatment theory and techniques in use: the *purposes* of the storyteller. As Bateson puts it (3), "The question, 'What am I trying to discover?' is not as unanswerable as mystics would have us believe. From the manner of the search, we can read what sort of discovery the searcher may thereby reach; and knowing this, we may suspect that such a discovery is what the searcher secretly and unconsciously desires" (p. 86). "But epistemology is always and inevitably *personal*. The point of the probe is always in the heart of the explorer. [One wonders: Is the double entendre intended?] What is *my* answer to the nature of knowing? I surrender to the belief that my knowing is a small part of a wider integrated knowing that knits the entire biosphere or creation" (3, p. 87).

We may at this point set forth the coevolutionary perspective in the form of an axiom: To the extent that an illness system is chronic, it must change elements of its context in the direction that will reduce discrepancy (improve the fit) between the illness behavior (target system) and the context. The improved fit must be 1) latent in the surround, or 2) achieved by changes induced by the target system in the surround. As noted earlier, the distinction between target system and surround depends on the purposes of the clinician-intervener.

"Random" signifies that the incident at the outset of the sequence we are tracking has (comparatively) little meaning for the family system. Initially it is relatively uncoupled, makes only a minimal fit, with elements in the surround. With the passage of time and the repetition of the pattern, the fit (i.e., the meaning) improves; the ease with which the component subsystems codetermine each other increases. In other words, the larger system coevolves; a self maintaining (chronic) pattern comes into being.

Fit as we are using the term can be thought of this way: Gas bubble and pain (and associated behaviors) derive their meaning from analogic congruence with the family-relationship configuration, a congruence most often

expressed in language as metaphor. Since the concept of fit is so central to the perspective of this paper, I wish to quote at length from Steier and Smith's paper, "Organizations and Second Order Cybernetics." They say,

> Von Glasersfeld, building on the foundations Bateson's critique offered, points out that many of the key misconceptions about adaptation arose because of how Darwin's famous dictum "the survival of the fit" became interpreted. This has, over the years, been translated into the "survival of the fittest," implying that it is the strong that survive. Von Glasersfeld discusses the inappropriateness of this view and adds to Bateson's notion that adaptation, without a concomitant shift in an entire distribution, can be a process through which variety becomes "eaten up" or reduced and thereby, flexibility is lost.
>
> Von Glasersfeld argues that a fruitful way to think about fit is in the metaphor of a key *fitting* into a lock. He notes that any particular lock may be opened by numerous keys, a dubious awareness we have due to the contribution of the professional burglar. If we discover a particular key opens the lock, we don't describe it as the fittest; we merely say it fits. In fact, no key that opens the door is any more or less fit than any other. What we do discover is that some keys will not open the lock no matter how much we pull and twist (15).

Evolution describes the process whereby a durable pattern of organization changes over time in such a fashion that distinguishably new forms are stabilized. It was Darwin's gift to see that this entire process, the change and the stabilization, was a function of the fit of the system and its environment, i.e., adaptation.

Fit describes the key-lock congruence of system and context. Quoting from von Glasersfeld (in Steier and Smith), "Darwin's dictum might be better expressed as 'the elimination of the *nonfitting* (or un-fit).' This switch in understanding makes the whole subject of adaptation into one where evolution is primarily one of elimination rather than survival. The mere fact that an organization has not yet had its contours so constrained that it doesn't 'fit into the lock' is no guarantee that this possibility isn't just around the corner. Hence, a more modest slogan for those surviving entities and one that is congruent with this evolutionary perspective is 'not yet extinguished' rather than 'survival of the fit.' It is the viability of the system, rather than its adaptability, that is critical" (15).

The question then becomes why so *few* cancer cells survive (9). A possible answer lies in the coevolutionary necessity: The cancer cells must induce the evironment to provide an evolutionary niche (7).

In the preceding quotation it appears that fit is being thought of as unidirectional, i.e., proceeding from target pattern to surround. As Bateson (4) tells us, the horse and the grassy plain coevolve; organism and context codetermine each other: "Surely the grassy plains were evolved *pari passu*

with the evolution of the teeth and hooves of the horses and other ungulates. Turf was the evolving response of the vegetation to the evolution of the horse. It is the *context* which evolves" (p. 155).

Family enters into our considerations when the relationship configuration in the family is *what the fit is with*. But obviously it is not necessary for the interface between illness pattern and *family* to be the location for the fitting. When System A and System B interface, any information in System A that is new or dissonant creates for System B the conditions for such a coevolutionary realignment.

Repetition and meaning are closely interrelated. Over time, as the *disease* pattern takes on meaning for the family/health-care configuration, it is repeated; as it is repeated it takes on meaning. Repetition, and the frequency with which it occurs, is critical for establishing a stable, i.e., chronic, pattern. Nothing is exactly repeated, *pace Heraclitus*; there is always some degree of changing fit between the elements of a pattern under consideration*. But it is in precisely this regard that an important additional element of chronicity enters: The target pattern, abdominal pain in one of our examples, is recruited into maintaining the stability of other systems or subsystems. Oliver Sacks is worth quoting on the relation of the random to meaning. In the language I am using in this essay, he notes first the random event occurring at one systems level that then has meaning ("elaboration and accretion of meaning"), i.e., *fit* with another. He describes in *Awakenings* the patient Miriam H, a post-encephalitic patient who had developed Touretts-like tics after treatment by L-dopa:

> An entirely novel symptom which had developed on the increased dose of L-dopa was a *tic*, a lightening-quick movement of the right hand to the face, occurring about twenty times an hour. When I questioned Miss H about this symptom, shortly after its inauguration, she replied that it was "a nonsense-movement." . . . Within three days of its appearance, however, this tic had become associated with an intention and a use; it had become a mannerism, and was now used by Miss H to adjust the position of her spectacles.

In the abdominal pain syndrome, the structure/function of the child's gut may be changed; a kind of "gut learning" takes place, mediated by the autonomic nervous system. In the absence of irreversible tissue changes, the pattern is maintained and stabilized by changes in the psychology of the child *and* the relational geometry of the family *and* the child's gastrointestinal physiology.

Mediation concerns us where events occur at two or more levels of com-

*The failure to recognize that fit is always partial and changing, and that some degree of asynchronicity is always present, has embroiled family therapists in endless and unproductive arguments about homeostasis. It is unfortunate that Ackerman never had any luck with his effort to promote the term homeodynamic. A look at the evolving galaxies might be salutary.

plexity. The notion of level is used here in the general systems sense. General systems theorists, for example James Grier Miller (10), have tended to take level for granted, without paying much attention to the place of language in establishing the concept. This leads to reification of the notion of levels as if they existed in nature. It is more useful to think of levels as a convention of constructed realities, but it is difficult to write about them that way—in English at least. Within a particular language system, such as that of physiology and biomedicine, it is necessary to be able to demonstrate the neuroendocrine-mediating links connecting psychosocial systems to organ systems.

Mediation refers to the process whereby change at one level is information about a difference for another; subsystems at that point are discrepant contexts for each other and dissonance-reducing takes place.

Reversible changes can become (comparatively) irreversible at any level, for example by the death and disappearance of a cell line, or by some process that radically distorts normal tissue architecture. We say comparatively irreversible to indicate that suprasystems may come into play to reverse the irreversible: the stored frozen sperm of a man long dead may fertilize the ova of a woman as yet unborn.

As time passes a metastable (chronic) system comes into being. The elements or components of the system *coevolve*, improve their mutual fit. The entire entity with which we are concerned—the problem-defined system —includes at a minimum the biology, psychology, and physiology of the patient, the relational structure of the multigenerational family, and the relevant aspects of the health-care system and of the larger society.

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