Winning the War, Losing the Patient: Metaphor in the Practice of Medicine

By

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Elizabeth Ross Dunn

FOR MY PARENTS

Elizabeth Jane Goodspeed Dunn

and

Donald Allen Dunn

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I wish to thank the many people in my life who have played important roles in this thesis. First, I offer heart-felt thanks to George Lakoff, whose brilliant ideas, books, and classes have changed my life. His enthusiastic response to my ideas gave me the courage to take extra time to pursue my research in metaphor and medicine.

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Throughout my life, I have had many inspirational contacts with physicians. Our family doctors, Esther Clarke and Myron Gananian, served as role models early in my life. The doctors in the Industrial Medicine Department at the Palo Alto Clinic offered me practical experience and friendly advice while I was a premedical student at Stanford. I also wish to thank Professor John Swartzberg, elegant raconteur and superb teacher. His commitment to literature and medicine has been particularly inspiring to me. Finally, my dear friend and colleague, Chef James Francis Nigro, M.D., has given me encouragement whenever I faltered and an endless supply of ridiculous medical anecdotes. I also appreciated the *torte* and *risotti* — sanks for ze memories!

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Finally, I wish to thank my incomparable parents, Elizabeth Jane Goodspeed Dunn and Donald Allen Dunn. My parents have encouraged me to travel my own road, smoothing the way when they could, helping me to get up when I fell, and always keeping the home door open. The best teachers I have ever had, my parents showed me that art and science do go together. Their graceful balancing of family and intellectual pursuits will always be an inspiration to me.

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PREFACE

> It seemed to Philip that he alone of the clerks saw the dramatic interest of those afternoons. To the others men and women were only cases, good if they were complicated, tiresome if obvious; they heard murmurs and were astonished at abnormal livers; an unexpected sound in the lung gave them something to talk about. But to Philip there was much more. He found an interest in just looking at them, in the shape of their heads and their hands, in the look of their eyes and the length of their noses. You saw in that room human nature taken by surprise, and often the mask of custom was torn off rudely, showing you the soul all raw.
>
> (Maugham, 1915; p. 499)

I went into medicine to experience this drama of human nature, hoping to play a meaningful role. I wanted a career that was based on human relationships, but I wanted to connect to others, patients and co-workers alike, around something that mattered. Medicine seemed rooted in something in which I could believe: human emotions, human intellect, the human spirit.

I've wanted to be a doctor since I was eight years old. Looking back, I realize that my interest was sparked by the relationship I had with my pediatrician, Dr. Esther Clarke. Dr. Clarke was tall and thin, with small wire glasses, grey hair, and a stern voice. She was not the stereotypical nurturing pediatrician; she often masked her emotions with a brusque manner, and she had been known to make children cry just by walking into the office. At the same time, Dr. Clarke radiated intelligence, humor, and most of all, caring. She travelled a great deal, bringing toys from all over the world for her patients to play with; the toys filled the bookcases in her office and covered her floor. She

always spoke directly to me, not just to my parents; she treated me as a person.

As a child, I travelled a lot with my family, and Dr. Clarke used to compare notes with me about our trips. I particularly remember a large, framed photograph that hung on the wall of the examining room, a photograph of a tortoise which she'd taken in the Galapagos Islands. I was entranced by the picture. Dr. Clarke took the time to ask me why I liked tortoises so much; she helped me see that I was drawn to their slow steadiness because I myself was a slow and steady kind of person.

I later learned that Dr. Clarke was one of the first pediatricians (and one of the first women physicians) in the area. She also played an important leadership role in the medical community; she had been instrumental in starting the clinic and was also the co-founder of a community fund-raising project which became a national model.

Medicine was the right place for Dr. Clarke; as a pediatrician, Dr. Clarke touched me, my family, and our entire community. Seeing her in action made me think medicine might also be the right place for me.

As I grew up, my interest in becoming a doctor persisted. I felt that my interests in literature and biology would intersect in medicine. I first discovered the magic of biology in high school. I was particularly intrigued by animal physiology, and by the time I graduated I had dissected a pig, a shark, a cat, and a human brain.

I grew up in a home filled with books, which indulged my passion for literature. My advanced placement English classes in high school, oriented towards literary analysis, fueled this interest. I was always most interested in character study, and my junior year I wrote an elaborate paper on the motivations of the characters in Anton Chekhov's *The Cherry Orchard*. My discovery of Chekhov opened up a whole world of literature and poetry by or about doctors; I read more Chekhov, and then Leo Tolstoy, Somerset Maugham, Lewis Thomas, George Eliot, Christy Brown, and William Carlos Williams.

The humanities focus our attention on the drama in human experience; they pay homage to the complexity of human feelings. Medicine, too, involves complex human emotions, "human nature taken by surprise," as Maugham said. The drama inherent to medicine explains why so many great works of literature have medical themes. We still speak of the "operating theatre," and the practice of medicine and experience of illness provide a modern stage for moving fictional dramas, from "M*A*S*H" to "China Beach" to "Purple Breasts." Like the Greek tragedies, caring for the sick potentially offers a catharsis, emotional purification by drama; anyone who has ever experienced a serious illness in the family can attest to this. In *The Doctor with Two Heads*, Gerald Weissman, one of my favorite physician-authors, quotes a poem about doctors which expresses this view:

> They pursue noble aims amid foul remnants
> and bloody dressings which serve as fertile texts
> from which one learns to read the great book of fate
> and to understand life from a rummage with death.
> (Faure, cited in Weissman, 1990; p. 14)

As a premedical student in college, I majored in biological sciences, but continued my humanities interests by studying Italian language, literature, and art. I even added on an extra quarter of college so I could study in Italy for six months. The summer after my senior year, I went to Greece; I made a special trip to the island of Kos, to see Hippocrates' Aesculapion. Pine-scented, warm, and peaceful, the spot still felt like a place of healing. Like many Greek ruins, the Aesculapion had the ineffable feel of being built on a human scale, to benefit human needs, emotional and spiritual as well as physical.

I believe that my commitment to the humanities stems from the same motivation as my commitment to medicine: an interest in the drama of human nature. When I got to medical school, however, I realized that most of my colleagues and professors saw the humanities as a side-line, something that was admirable only in that it made a physician a more well-rounded person. Clinical medicine is taught as a biological science. It is not oriented towards human responses to biological crises; in none of our classes are we are concerned with the part of medicine where we see the "soul all raw."

My impression is that medical training tends to extinguish our appreciation of the drama in medicine. Looking back, I realize that the origins of this thesis can be traced my dissatisfaction with this situation; this thesis represents my attempt to reclaim the drama I believe to be present medicine. When I came to the Joint Medical Program, I was planning a thesis in epidemiology. After my first year, however, I decided to write this thesis on a literary topic; I think I was searching for the focus on human nature missing from my medical training.

However, in my last year of the three year combined basic sciences/Master's program, I took a class in cognitive linguistics with Professor George Lakoff. The class was about conceptual metaphors (like LIFE IS A JOURNEY or AN ARGUMENT IS WAR) and the way they reflect and structure our experience. In the course, students were encouraged to write papers about metaphors in areas of their own expertise.

I began looking at medicine more closely, becoming more conscious both of my own feelings of dissatisfaction and of the prevalence of metaphor in medical language. Our conceptualization of disease, patients, even our own roles as physicians or physicians-in-training, is structured to a great extent through metaphor. A compelling pattern began to emerge, and I changed my thesis topic and added an extra year to my progam to continue work in this area.

Medicine's dominant metaphors are not random, nor are they idiosyncratic reflections of the speech of individual doctors. As I will demonstrate, these conceptual metaphors are systematic and consistent, structuring a cognitive model of medicine that directs current medical practice. As we shall see, the specific conceptual metaphors medicine currently employs help keep the drama of medicine at bay, providing us with an emotional buffer. It is just this buffer which makes it so hard to have relationships with patients like I had with my pediatrician, and it is this buffer which makes an affirmation of the drama inherent in medicine so difficult.

In this thesis, I focus on the problems of modern medicine and the difficulties in making the necessary improvements. However, I wish to acknowledge that by so doing, I de-emphasize the positive. While this paper takes a critical look at doctors and at medical practice, the achievements of medicine cannot be denied. I have been inspired in my own professional life by the interpersonal skills demonstrated by many of my teachers and by doctors I have met in the course of my own health care. I am proud to be a medical student, and I look forward to completing my training and becoming a full-fledged doctor.

In summary, my aim is to demonstrate that metaphors affect our health.I believe that the human experiences of illness and wellness, of giving and receiving health care, are intimately related to the ways in which we understand those experiences. I further believe that this understanding, at both conscious and unconscious levels, is reflected and shaped by metaphor. This thesis is thus the result of my interest in metaphor as it affects the very human practice of medicine.

INTRODUCTION

The Problem and the Approach

American medicine is in a state of flux. While adapting to the demands of modern social and economic realities, medicine is nonetheless entangled in traditional patterns of thought and action. In some ways, medicine is flourishing; biomedical breakthroughs in treatment and disease etiology are common, and medical technology is at its most advanced. In other ways, medicine is failing; criticism has been leveled at the current medical system from many directions. In *The Second Medical Revolution*, Lawrence Foss and Kenneth Rothenberg describe four common areas of concern:

> •The growing concern that medicine's range of significant etiological factors is limited. Too much that pertains to our general sense of health falls outside the domain of medicine per se.
>
> •Medicine's failure to achieve the same successes in the cure of chronic diseases as it has with infectious diseases. The disappointing results to date from the expensive war on cancer serve as an example.
>
> •Medicine's guidance by principles that fail to acknowledge the human role in creating social conditions (overcrowding, crime, pollution, etc.) that themselves are agents in promoting disease.
>
> •The dissatisfaction resulting from the depersonalization of the doctor-patient relationship—an index of which is the increased number in the medical ranks who provide specialized as opposed to primary care.
>
> (Foss and Rothenberg, 1987; p.5)

Many agree that significant changes in the American medical system are necessary (Engel, 1977, 1987; Dossey, 1982; Arney and Bergen, 1984; Kleinman,

1988; Cousins, 1989). Some have suggested that we must improve medical education, particularly in the areas of relationship skills, self-awareness, and personal growth (Shapiro, 1987; Suchman and Matthews, 1988). Other critics have suggested nothing less than a change in the essential paradigms upon which medicine rests (Dossey, 1982; Foss and Rothenberg, 1987). Still others have suggested that economic solutions are necessary (Todd, et al., 1991).

These problems, however conceived, are rooted in the assumptions and priorities which drive medicine. Language reveals these assumptions and priorities through metaphor; metaphors are the basis for many of our unconscious attitudes about the meaning of illness, health, the role of the patient, and the role of the doctor. What do the metaphors used by medicine tell us about medicine's assumptions and priorities? Answering this question is the goal of this thesis.

I will approach this question using a technique of metaphor analysis developed in cognitive linguistics. The first section of this thesis describes this method of analysis. I believe that this approach will help me to present a valuable new perspective on the practice of medicine. The bulk of my thesis is concerned with the actual analysis of examples of medical language. I will primarily use texts created by and for the medical profession, but I will also discuss selected works of non-medical literature to demonstrate the pervasiveness and power of these metaphors.

I will focus on what I believe to be the two primary metaphors of medicine: MEDICINE IS A REPAIR BUSINESS and MEDICINE IS WAR. I hope to demonstrate the relationship of these metaphors to our understanding of

health and disease.

The first half of my analysis is a discussion of the metaphor system based on the general conceptual metaphor MEDICINE IS A REPAIR BUSINESS. I will examine the role of the biomedical model, reductionism, and Cartesian dualism in originating and perpetuating this metaphor. I will then discuss the implications of this metaphor for medicine: patients are understood as broken machines, medicine is understood as a repair business, and doctors are understood as technicians. I will conclude this section with three case studies, examining the metaphors MENOPAUSE IS OVARIAN FAILURE, THE MIND IS A MACHINE, and THE HEART IS A PUMP.

In the second half of my analysis, I will examine the system of war metaphors used in medicine and their relationship to casual, daily language concerning health and illness. I will discuss four specific cases of this system of metaphors. First, I will discuss the earliest war metaphor, HUMAN INTERACTION WITH DISEASE IS WAR. In this metaphor, humans are seen as the defenders against the invading disease, and the role of the doctor is that of ally to the defender.

Second, I will look at the IMMUNOLOGY IS MODERN WARFARE metaphor. Here, the battle is also between human and disease, but the battle has become more specific. The combatants are the invading microorganisms, which cause infectious diseases, and the primary defender, the individual ill person.

Third, I will examine the MEDICAL MICROBIOLOGY IS KNIGHTLY COMBAT metaphor, which pits the medical microbiologist against the microorganisms causing infectious disease. In this metaphor, the individual patient is not directly involved; the role of the research doctor becomes primary, the chivalrous hero fighting for the sake of humanity.

Finally, I will discuss the metaphor MEDICINE IS A GROUND WAR. I assert that this metaphor generalizes from the previously described metaphor, MEDICAL MICROBIOLOGY IS WAR; the enemy becomes not merely infectious diseases, but disease in general. All physicians, not just research doctors, are the primary combatants fighting this enemy. I assert that in the context of this metaphor, medicine loses sight of its human imperative; the patient disappears as a major player in the conflict. In fact, the cognitive system implied by this pervasive and powerful war metaphor leaves room for neither the patient nor the patient's experience. The metaphoric mapping of MEDICINE IS A GROUND WAR relegates the patient to the role of battlefield, the ground over which the primary combatants, medicine and disease, wage all-out war.

For each area of metaphor analysis, I will discuss the problems created by the metaphor and the implications of my analysis for medical practice. I believe that both of the general metaphoric systems I have selected, MEDICINE IS A REPAIR BUSINESS and MEDICINE IS WAR, affect many aspects of the human experience of the medical system. As we will see, these metaphors have significant implications for the economics of medicine, for ethical decision-making, for the teaching of medicine, and most of all, for the relationship between doctor and patient. Metaphors reveal a certain

unconscious conceptual system shared by those in the medical world. Only by making this conceptual system conscious can we begin to decide what to change and what to preserve in our complex medical system.

METHODS

A number of competing linguistic theories of metaphor exist (Davidson, 1978; Searle, 1979; Mac Cormac, 1985). In this study of metaphor in medical language, I will be using the view of metaphor developed by Lakoff and Johnson. Using linguistic evidence, Lakoff and Johnson have demonstrated that metaphor is at the heart of human conceptual systems. Metaphor

> [Metaphor] is pervasive in everyday life, not just in language but in thought and action. Our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature.
>
> (Lakoff and Johnson, 1980; p.3)

I will use the term "conceptual system" as defined by Lakoff and Johnson, as a central but primarily unconscious organizing principle of the mind.

> The concepts that govern our thought are not just matters of the intellect. They also govern our everyday functioning down to the most mundane details. Our concepts structure what we perceive, how we get around in the world, and how we relate to other people. Our conceptual system thus plays a central role in defining our everyday realities...
>
> But our conceptual system is not something we are normally aware of. In most of the little things we do every day, we simply think and act more or less automatically along certain lines. Just what these lines are is by no means obvious. One way to find out is by looking at language. Since communication is based on the same conceptual system that we use in thinking and acting, language is an important source of evidence for what that system is like.
>
> (Lakoff and Johnson, 1980; p.3)

This view of human language and cognition is the primary assumption of this thesis. Metaphors reflect and inform these conceptual systems, which in

turn affect our behavior. A metaphor allows us to comprehend one thing in terms of another. More specifically, a metaphor allows us to understand the abstract in terms of the concrete, the complex in terms of the more basic, new experiences in terms of experiences we already understand. Many of the concepts which are important to us as humans are not rigidly laid out in our experience (time, ideas, emotions, etc.). In order to make sense of these concepts, we rely on metaphor; in a sense, metaphor translates these problematic concepts into concepts that we already understand in clearer terms (movement, objects, etc.)

This view of metaphor is rooted in the philosophical position known as experiential realism. Experiential realism is based on the work of Benjamin Whorf, Eleanor Rosch and more recently, Lakoff and Johnson; much of the evidence for this position has emerged from contemporary work in cognitive science on categorization. Experiential realism assumes that human reasoning is constrained and organized by human physiology, particularly on the way we interact with our cultural and physical environments. Concepts are defined not in terms of inherent qualities, but in terms of interactional properties: perceptual, motor-activity, functional, etc. The experiential repertoire of a thinking organism is thus intrinsically linked with that organism's potential for thought.

> On the experientialist view, reason is made possible by the body—that includes abstract and creative reason, as well as reasoning about concrete things. Human reason...grows out of the nature of the organism and all that contributes to its individual and collective experience: its genetic inheritance, the nature of the environment it lives in, the way it functions in that environment, the nature of its social functioning and the like. (Lakoff,1987; p. xv)

The key elements of experiential realism are that human conceptual systems have *gestalt* properties, are embodied, and are imaginative. Let us look briefly at each of these assertions.

First, concepts are not assembled from simple conceptual components by a few general rules. Thought has *gestalt* properties, where the total is greater than the sum of the parts; these *gestalt* properties of thought are what allow us to do things like distinguish a "good" from a "bad" book or to categorize an organism we've never seen before as a "bird."

> Such gestalts are *experientially basic* because they characterize structured wholes within recurrent human experiences. They represent coherent organizations of our experiences in terms of natural dimensions (parts, stages, causes, etc.). Domains of experience that are organized as gestalts in terms of such natural dimensions seem to us to be natural kinds of experience.
>
> (Lakoff, 1987; p. 117)

These kinds of experiences are natural in the sense that they result from our bodily experiences, our interactions with the external environment, and our sociocultural interactions. This brings us to the second assertion; thought is embodied. The embodiment of thought suggests that our bodily experience — motor capabilities, sensory perception, psychosocial experiences — ground our conceptual systems.

Where thoughts cannot be grounded in this sort of bodily experience, thought is imaginative; it goes beyond what we can see and feel directly. In imaginative thought, we use mental imagery, metaphor, and metonymy to move beyond the range of literal representations of external reality and to characterize abstract, complex concepts. This imaginative thought, however,

is also indirectly embodied; the metaphors, metonymies, and mental images that we choose are influenced by our own physical and social experiences.

Let us now turn to an example of how metaphor structures our experience. Consider the concept of an argument. Lakoff and Johnson provide the following common linguistic examples of how we talk about and understand argument:

> Your claims are *indefensible.*
> He *attacked every weak point* in my argument.
> His criticisms were *right on target.*
> I *demolished* his argument.
> I've never *won* an argument with him.
> You disagree? Okay, *shoot!*
> If you use that *strategy,* he'll *wipe you out.*
> He *shot down* all of my arguments.
> (Lakoff and Johnson, 1980; p. 4)

Each of these phrases describes an element of argument in terms of war. The examples represent part of a system of metaphors which can be described as the conceptual metaphor, ARGUMENT IS WAR. Lakoff and Johnson point out that not only do we talk about arguments in terms of war, but we actually "live by" the metaphor; we think and act as if arguments were war. For example, people think of themselves as winning or losing arguments, using strategies of attack, gaining ground or losing it. We even become emotionally involved in arguments in terms of war; we often come to think of a person with whom we are arguing as the enemy, and we gain or lose self-esteem depending on whether or not we can defend our position.

> This is an example of what it means for a metaphorical concept, namely, ARGUMENT IS WAR, to structure (at least in part) what we do and how we understand what we are doing when we argue. *The essence of metaphor is understanding and experiencing one kind of thing in terms of another.* It is not that

> arguments are a subspecies of war. Arguments and war are different kind of things—verbal discourse and armed conflict—and the actions performed are different kinds of actions. But ARGUMENT is partially structured, understood, performed, and talked about in terms of WAR. The concept is metaphorically structured, the activity is metaphorically structured, and consequently, the language is metaphorically structured.
>
> Moreover, this is the *ordinary* way of having an argument and talking about it. The normal way for us to talk about attacking a position is to use the words "attack a position." Our conventional ways of talking about arguments presuppose a metaphor we are hardly ever conscious of. The metaphor is not merely in the words we use—it is in our very concept of an argument. The language of argument is not poetic, fanciful, or rhetorical; it is literal. We talk about arguments that way because we conceive of them that way—and we act according to the way we conceive of things.
>
> (Lakoff and Johnson, 1980; p. 4)

Besides ARGUMENT IS WAR, many other examples of prevalent metaphorical concepts in our culture exist: LIFE IS A JOURNEY (We're *spinning our wheels*/ I just can't seem to *get where I want to go*/ She *hit a road block*); TIME IS MONEY (You're *wasting* my time/ How have you been *spending* your time?/ Is that *worth* your while?/ He's living on *borrowed* time/ That flat tire *cost* me an hour); and SEEING IS TOUCHING (Don't *take your eyes off of him* for a second/ His eyes are *glued* to the TV/ She *ran her eyes over* everything in the room).

Lakoff and Johnson point out that metaphors like these help us understand basic domains of experience such as life or time, not just isolated concepts. They actually structure these basic domains of experience. "Argument is an obvious example, since experiencing certain activities of talking and listening as an argument partly requires the structure given to the concept ARGUMENT by the ARGUMENT IS WAR metaphor" (Lakoff and Johnson,

1980; p. 118). Different metaphors structure experiences differently. For example, the metaphor AN ARGUMENT IS A JOURNEY (She *set out* to prove that he was an embezzler/ Nobody has said anything convincing *so far*/ By the time *she arrived at* her conclusion, everyone was asleep) highlights the purpose or progress of an argument rather than the hostile relationship between arguers.

Lakoff and Johnson describe the structure of metaphorical concepts as a source-to-target mapping. We understand the target domain in terms of the source domain; for example, we understand LIFE in terms of JOURNEY, TIME in terms of MONEY, SEEING in terms of TOUCHING, and ARGUMENT in terms of WAR. In other words, the source domain is *mapped* onto the target domain. In my analysis, I will use the following sort of schematic to highlight metaphorical mappings:

SOURCE DOMAIN		TARGET DOMAIN
JOURNEY	---------->	LIFE
MONEY	---------->	TIME
TOUCHING	---------->	SEEING
WAR	---------->	ARGUMENT

Source domains and target domains tend to differ systematically in quality. As mentioned earlier, more abstract, complex concepts are the ones for which we need metaphors; we understand the target domain (life, time, seeing) in terms of the more concrete source domain (journey, money, touching). Source domains tend to be "concepts that are linked more directly to experience, concepts that are information-rich and rich in conventional

mental imagery" (Lakoff, 1987; p. 406). Thus, a conceptual metaphor consists of a set of source and target domain correspondences. These correspondences are of two kinds: ontological and epistemological.

Ontological correspondences are those between the entity in the source domain and the corresponding target domain entity. For example, "opposing forces" in the source domain of ARGUMENT IS WAR correspond to "people arguing" in the target domain. Ontological correspondences thus define the source to target mapping:

SOURCE DOMAIN	TARGET DOMAIN
WAR ---------->	ARGUMENT
OPPOSING FORCES---------->	PEOPLE ARGUING

Epistemic correspondences, on the other hand, are knowledge correspondences between source and target domains. Effective metaphors involve a source domain which fits the knowledge we have of the target domain. However, we usually have more extensive knowledge regarding source domains than target domains. Details of this knowledge are usually carried over from the source domain to the target domain; I will refer to such carryovers as "metaphorical entailments."

Metaphorical entailments are important parts of our conceptual system. They characterize the metaphor's internal systematicity and make the examples of the metaphor coherent with each other. For example, in the ARGUMENT IS WAR metaphor, source domain knowledge tells us that war involves aggression. The metaphoric entailment is that arguments involve aggression. This makes sense of comments like "She attacked every weak point in his

argument." Similarly, knowledge of war tells us that the emotional effect of winning a war is exhilaration, while losing a war is humiliating. Correspondingly, target domain knowledge tells us that winning an argument is exhilarating, while losing an argument is humiliating: "Yeah, John really got the best of me in that argument; I went home with my tail between my legs." This entailment is coherent with the previous example; the experience of being the loser of an argument fits with being on the losing end of an aggressive encounter.

Given this structural understanding, we can evaluate the strength of a metaphoric mapping. Strength of mapping can be described by three measures: clarity, richness, and coherence. (Gentner, 1982; pp. 113-114, and Lakoff,1987; p. 91) Most metaphors account for many, but not all, of the target domain's ontology; "clarity" refers to the precision with which ontological mappings are described. "Richness" refers to the quantity or density of entailments. "Coherence" is the systematicity of the metaphor, the degree to which we can derive one entailment from another in the metaphor. For example, the metaphor ARGUMENT IS WAR has high mapping clarity, because many ontological elements of the target domain, argument, are mapped by the source domain, war; the metaphor is also a rich and coherent one, because many entailments are mapped by the metaphor, and these are systematically related.

Metaphoric mappings provide an identifiable structure for our thought processes and a window on the human mind.

> The most important claim we have made so far is that metaphor is not just a matter of language, that is, of mere words. We shall

> argue that, on the contrary, human *thought processes* are largely metaphorical. This is what we mean when we say that the human conceptual system is metaphorically structured and defined.
>
> (Lakoff and Johnson, 1980; p. 4)

As I intend to demonstrate, the conceptual system around which medicine is organized is also structured metaphorically. In the following sections, I will use the linguistic perspective described above to examine the evidence for selected medical metaphors and to discuss their implications for the practice of medicine.

METAPHOR ANALYSIS:
MEDICINE IS A REPAIR BUSINESS

OVERVIEW

> Part of the problem, says Jay Thorwaldson, the medical foundation's community relations director, is that people are expecting too much from their doctors..."In the old days doctors did a lot of consoling and emotional support giving," Thorwaldson observes. "You had to have a good bedside manner. Now we can do so much more medically for somebody; perhaps people are looking for physicians to be more than they can be. They are not trained in medical school to do consoling and hand-holding. People should be looking to counselors and support groups for that. They should look to their doctors as technical experts."
>
> (Sacks,1990; p. 17)

The hospital administrator quoted here seems to be suggesting that the health care system today can do something "medically" in the absence of a good bedside manner, in the absence of emotional support giving. His attitude reflects the generalized Western embrace of the legacy of Cartesian dualism, which promotes thinking of the mind and body as separate.

> Medicine arose out of the magic and ritual of religious healing...By the time of the Renaissance, however, with Descartes' assertion of the duality of mind and body, the separation of medicine from religion was well underway.
>
> (Suchman and Matthews, 1988; p. 126)

Western medicine today continues this separation. Medicine tends to prefer dealing with the body, leaving the mind and spirit to be tackled by other fields, from social work to theology. Cartesian dualism thus provides the necessary background for a rich and widespread system of conceptual

metaphors pertaining to the body and to medicine, the system used by the administrator quoted above and by many others. The central metaphor of this system is THE BODY IS A MACHINE.

Arney and Bergen allude to the origins of this metaphor in their book *Medicine and the Management of Living*. They describe the state of medicine in the mid-eighteen hundreds:

> Life had become identified with specific structures and functions of the body and the pathological was identified with deviations from normative states, displays of the various ways the body decomposes through the action of disease. The machine became the compelling metaphor for the body.
> (Arney and Bergen, 1984; p. 23)

I assert that medicine today is *still* based upon a system of metaphors conceptualizing the body as a machine. The general application of this metaphor to medical practice is that the target domain, medicine, is understood in terms of a repair business. The specific mappings of this conceptual metaphor system are as follows:

SOURCE DOMAIN		TARGET DOMAIN
REPAIR BUSINESS	---------->	MEDICINE
MACHINE	---------->	BODY
BROKEN MACHINE	---------->	PATIENT
MECHANICAL BREAKDOWN	----->	DISEASE
REPAIR or REPLACEMENT	---------->	TREATMENT
TECHNICIAN	---------->	DOCTOR

The existence of this conceptual metaphor makes sense of the idea that the

doctor/patient relationship can exist without attention to human emotional experiences. The administrator whom I quoted above subtly puts down caring, referring to it in a patronizing way as "hand-holding" and "consoling"; he suggests that doing "more medically" means simply doing more technically. This only makes sense if we can understand the body as separate from emotions, and the role of medicine to be limited to dealing with the body; this metaphor was generated from and can only be understood within a Cartesian framework.

In the remainder of this section, I will briefly discuss each of these mappings, with attention to the entailments involved. As mentioned earlier, metaphorical entailments represent details of source domain knowledge that is carried over and mapped onto the target domain. I will then turn to a discussion of certain problems posed for medical practice by the MEDICINE IS A REPAIR BUSINESS metaphor. Finally, I will examine the repair business metaphor in greater detail by means of three case studies: 1) MENOPAUSE IS OVARIAN FAILURE, 2) THE MIND IS A MACHINE, and 3) THE HEART IS A PUMP.

METAPHORIC MAPPINGS

The body is a machine

The BODY IS A MACHINE metaphor is so prevalent in American society that most of us find it easy to think about any body in those terms. For example, medical journalist Lynn Payer has pointed out that while the French go on vacation in order to "change ideas," Americans go to "recharge their batteries" (Payer, 1988). The BODY IS A MACHINE metaphor pervades our way of thinking: "For members of Western society, the body is a discrete entity, a thing, an 'it,' machinelike and objective, separate from thought and emotion" (Kleinman, 1988; p. 11).

The metaphor MEDICINE IS A REPAIR BUSINESS is rooted in this tradition of language as well as in American history. American medicine has a history of business connections. At the turn of the century, American medicine lagged behind that of Western Europe. At this time, however, philanthropic organizations like the Carnegie and Rockefeller foundations poured profits from American business into medical schools and medical research, and American medicine soon took on a leadership role. Immediately after World War I, business and the economy boomed. Americans came to think of themselves as "can-do" businesspeople, always able to make a deal. Americans felt good about themselves, but health data from induction physicals of soldiers-to-be, the first national physical examination performed in the U.S., suggested that Americans were not as healthy as they thought. Accordingly, after the war, Americans were told they should have a check-up every year. (Reiser, 1978)

At the same time, the automobile became a vital part of normal American life. In *Medicine and Culture*, Lynn Payer comments that a specific mechanical metaphor for the body, THE BODY IS A CAR, also originated just after World War I, "perhaps concurrent with the growing popularity of the automobile" (Payer, 1988; p. 148). Since the body was already conceptualized as a machine, and Americans saw the car as the quintessential machine, conceptualizing the body as a car was only natural.

Combining business and car metaphors, Dr. Logan Clendening spoofs the popular public health campaign for annual physical examinations in his 1928 book, *The Care and Feeding of Adults*. He tells the story of a "captain of industry," age 58, active, happy, healthy:

> And then, one fatal day at his club, he heard of the Health Audit. The idea (I fall into the lingo of Service) Appealed to him Instantly.
> He was going to have his Health Audited.
> Would he let his business go a year without having an Audit? He would Not!
> Would he let his automobile run three months without an Overhauling? No.
> Was his Body less important than his automobile?
> If there was anything the matter with him he wanted to know it, So He Could WATCH *Himself*.
> If his Kidneys Needed Watching, he intended to WATCH them.
> If that Heart was in a threatening condition, he intended to take up a Position of Vantage where he could WATCH It.
> If his Blood-pressure was Rising (though he guessed it wasn't), it would claim his Undivided Attention.
> He was going that very afternoon to the Health Audit Company....
> Now he insists in conversation that the health audit lengthened his life ten years, though he has lived only two and a half since it was made, and he intends to be audited again next year.
>
> (Logan Clendening, 1928; pp. 27-31)

According to Payer, THE BODY IS A CAR metaphor has continued in popular notions of self care.

> Body as car apparently caught the American imagination, and the metaphor was embellished. "Think of your body as a superautomobile," reads a typical American how-to book, *How to Live Cheap but Good*. "If you don't drive it too fast for too long, and if you feed it the right fuel, give it periodic checkups, and maybe wash it occasionally, you'll prevent major rumblings or at least treat them before they climax in a transmission."
> (Payer, p. 148)

MEDICINE IS A REPAIR BUSINESS thus combines two important conceptual metaphors, HEALTH CARE IS A BUSINESS and THE BODY IS A MACHINE.

The patient is a broken machine

The general metaphor, THE BODY IS A MACHINE, is recast in the medical world as THE PATIENT IS A BROKEN MACHINE. Most medical students' first encounter with a human body in the context of medicine does not involve a living patient, but rather a cadaver in gross anatomy. Delese Wear has examined the poetic responses of medical students to this first physician-patient encounter. She found that the "most pervasive theme was the attempt of the anatomy student to know the cadaver as a person" (Wear, 1987; p. 123). As one student wrote, "I have seen your eyes and learned the muscles that open and close them/ But I know nothing about how you looked at others or yourself" (Baldree, 1982; in Wear, 1987; p. 126). Another student's poem expresses a similar frustration:

> That these human hands which I caress
> with sharp steel and curious fingers
> Touched once themselves
> unknown tools

and unnamed others.
(O'Neill, 1982; in Wear, 1987; p. 125)

The anatomy experience effectively demonstrates to students that the "person" is certainly not in the dead body. Nonetheless, a powerful feeling of entering someone's private space is elicited in the student by the process of dissection. "The intimate relationship betwen student and cadaver permeated much of the poetry" (Wear, 1987; p. 128).

You said not a word
As I ripped into your flesh
Probing deeper than any lover.
(Kaminow, 1983; in Wear,1987; p. 128)

A non-medical student friend once asked me how I could stand to dissect a person. I responded that I felt the cadaver was not a person: "the owner just wasn't there." I went on to describe how nonetheless, I felt I knew a lot about the person just from what I knew about his body. After listening to me for a while, my friend, who had once worked as an auto mechanic, commented that it sounded much like working on someone's car. You could tell a lot about people from their cars, he said; what kind of car it was, how old, how well-taken care, whether it had a stereo, how many dents it had, etc. In many ways this was an excellent comparison; it certainly sheds light on how medical students might use the body as car metaphor. In this formative first experience, our patients are absent, and we are left to deal with their damaged bodies as best we can. Small wonder we come to think of patients as broken machines, when the metaphor so aptly describes our first patient encounter.

The most important entailment of THE PATIENT IS A BROKEN MACHINE involves the patient's treatment. If the patient is conceptualized as a machine,

an entity with no independent emotions or needs, then the patient is treated in that way. For example, in a car repair business, how or when the mechanic works on the car is only the mechanic's business (and the business of those who supervise the mechanic). This knowledge appears to have been mapped onto medicine:

> The professional sector's institutions are profession- rather than patient-centered. Zerubavel (1981) has shown this to be the case with the organization of time in the hospital, which is ordered to fit the work hours and needs of hospital staff more than the needs of patients and their families. And this is true of the way space is arranged, too. Movement through the professional sector of care bewilders many patients. There are few maps to make sense of the system for users.
>
> (Kleinman, 1988; p. 263)

Unconscious use of the MEDICINE IS A REPAIR BUSINESS metaphor to conceptualize the role of patients allows administrators to focus on the business aspects of health care. Running the hospital smoothly and profitably becomes the chief concern. For example, if the patient is understood as a machine, administrators need not worry about complicated, expensive scheduling which attempts to provide continuity of care; cars don't care about having the same mechanic for a tune-up. The conceptual system informed by this metaphor permits practices that may seem less than humane to an observer. For example, patients are awakened from sleep in the middle of the night for routine blood-pressure checks or for purposes of record-keeping.

In this metaphor, the patient has meaning to medicine only insofar as his or her body is to be repaired. For example, doctors describe patients suffering from asthma as "not moving air" (Nigro, 1991; personal communication). At worst, the patient as a whole is understood as a broken machine; knowledge

carried over from the source domain, machine, tells us that the target domain, the patient, has little or nothing to bring to the medical encounter. At best, the patient's *body* is seen as the broken machine; an important entailment here is that the patient and patient's body are seen separately and do not comprise an integral unit. In either case, the doctor, as the technician, obviously knows better than the patient how to repair the damage. These entailments of the repair business metaphor may help to explain the devaluation of the patient perspective in medicine, noted here by a sociologist:

> If information produced by means of diagnostic technology is valued in the language of case presentation, information obtained from the patient is devalued. Technology "reveals" and "shows"; the physician "notes" or "observes"; the patient "reports" and "denies." The language of case presentation reflects a clear epistemological hierarchy in which diagnostic technology is valued most highly, followed in descending order by the physician's observations and finally by the patient's account.
>
> (Anspach, 1990; p. 334)

The medical distinction between "signs" (what the physician sees) and "symptoms" (what the patient experiences) also demonstrates a low value of the patient's experience.

> For the practitioner, the patient's complaints (symptoms of illness) must be translated into the signs of disease. (For example, the patient's chest pain becomes angina - a sign of coronary heart disease - for the physician.)
>
> (Kleinman, 1988; p. 16)

This sort of attitude makes sense in a conceptual system in which the patient is understood as a broken machine. A patient's experience of a particular symptom is really only relevant to the technician insofar as it helps the doctor fix the underlying problem. The doctor values her own evaluation of a sign

much more than the patient's subjective report of an experience which may or may not be important to the problem at hand.

Disease is mechanical breakdown

In the repair business system of metaphors, we have seen that the patient is conceptualized as a broken machine. Naturally, disease is also conceptualized in mechanical terms; in fact, the machine metaphor is so prevalent in pathophysiological descriptions of disease states that speaking or thinking in other terms is next to impossible. Medicine conceptualizes the healthy body as a working machine and conceptualizes disease as mechanical breakdown.

If the DISEASE IS MECHANICAL BREAKDOWN metaphor is indeed part of the American medical conceptual system, we would expect to find that one of the main activities of American medicine would be an evaluation of how well the body is "working" mechanically. This in fact proves to be the case; evaluations of breakdowns are carried out by means of varying "tests": liver function tests, kidney function tests, pulmonary function tests, etc. Thus an important entailment of seeing disease as mechanical breakdown is that medicine comes to expect diagnosis of disease to be accomplished mechanically also. For example, the diagnosis of certain lung diseases are made by a series of mechanical tests of lung function: "Pulmonary function tests (volume and capacity tests) are a series of measurements that evaluate ventilatory function through spirometric measurements..." (Ford, ed., 1987; p. 649).

These mechanically oriented "function" tests tend to be preferred over other

forms of diagnosis such as history-taking or physical exam. "Biochemical measurements, together with simple laboratory examinations such as blood count, urinalysis, and sedimentation rate, often provide the major clue to the presence of a pathologic process" (Braunwald et al., eds., 1987; p. 3). A number of studies have demonstrated that this tendency is not universal, but particularly prevalent in the United States; American doctors, especially internists, tend to order more medical tests than their European counterparts (Payer, 1988).

One of the most important questions asked about a disease in medicine depends on the machine metaphor for the body: "What's the mechanism?" The mechanism is usually described in mechanical terms, e.g. "Mechanisms of hormonal hyperglycemia include varying combinations of impairment of insulin release and induction of insulin resistance" (Braunwald et al., eds., 1987; p. 1779).

One mechanism of disease is that organs can be overloaded and then break down; for example, the premier medical pathology text mentions that "major surgery, heart failure, or shock, may serve as the final straw when the hepatic functional reserve is already precarious" (Cotran, Kumar, and Robbins, eds., 1989; p. 918). When this happens, we speak of organ failure: liver failure, kidney failure, heart failure.

Other mechanisms are biochemical and are described in mechanical terms on a microscopic level: "Absence of the chloride-bicarbonate ion exchange "pump" causes profound symptoms even before birth" (Braunwald et al., eds., 1987; p. 1623).

A mechanism is necessary to legitimate a disease in the eyes of medicine; this makes sense, given the prevalence of the DISEASE IS MECHANICAL BREAKDOWN metaphor. When a disease lacks a known mechanism, that disease is treated with some skepticism. For example, "chronic fatigue syndrome" is the medical term for a constellation of symptoms including low-grade fever, sore throat, myalgias, headaches, and sleep disturbances as well as fatigue. Thousands of Americans complain of these symptoms and find them utterly debilitating. Nonetheless, medicine does not seem to be sure that the disease is real, because no known mechanism exists.

Even the name "chronic fatigue syndrome" seems to reflect medicine's ambivalence about the condition these patients suffer. One patient wrote a letter about this problem several years ago:

> I am a patient suffering from chronic fatigue syndrome and I am appalled that it has been given such a trivial name...Let me be clear, the disabling weakness and exhaustion a patient with chronic fatigue syndrome experiences is so profound that *fatigue* is a euphemism at best, and more probably an insult.
> (Cuozzo,1989; p. 697)

In the time since this letter, medicine has still not embraced the disease wholeheartedly. If anything, in the continued absence of a mechanism of disease, skepticism has mounted. The title of a recent article in *Postgraduate Medicine* reviewing the case for chronic fatigue syndrome appeals to this skeptical viewpoint: "Chronic fatigue syndrome — Is it real?" (Kroenke, 1991). The author suggests that one reason this question is still being asked is that medicine and patient support groups often fight among themselves.

> This has occurred, in part, because physicians have been insufficiently sympathetic or interested. At the same time, support groups have too often focused exclusively on the latest organic explanation, changing from chronic mononucleosis to chronic fatigue to chronic fatigue and immune dysfunction syndrome.
>
> (Kroenke, 1991; p. 55).

This passage demonstrates a subtle bias on the physician author's part. He does not criticize doctors for not taking care of patients properly, for failure to find a cure, or for lack of intelligent research. He simply says that physicians need to be more interested and sympathetic. The problem he sees is not that patients are suffering unnecessarily from a disease for which no one has found a cure; the problem is that doctors are being too obvious about their skepticism and lack of interest in a disease without a mechanism. Kroenke also castigates patients for doing exactly what medicine regularly does, which is focus on mechanical explanations for disease. He claims that patients are "too" interested in promoting the physical causes of their condition; it's as if he sees their interest as a little *gauche*, too obvious.

Patients have obviously discovered that if their disease is seen to be lacking a clear physical cause, they will not get the treatment and the social benefits of the sick role which they desire. Accordingly, they focus on scientific, physical mechanisms for chronic fatigue syndrome (like Epstein-Barr virus) in an attempt to get medicine's support. The author of this article criticizes the patients' movement because it impinges on medicine's autonomy; these patients are trying to use medicine's own arguments to force medicine to embrace chronic fatigue syndrome.

Kroenke never directly answers the question he poses in the title. His implied

answer is that chronic fatigue syndrome is real to patients, if not to doctors. He claims that, despite the absence of a convincing biomedical explanation for the syndrome, physicians can help patients suffering from chronic fatigue: "When the cause of chronic fatigue syndrome is not readily apparent, as is often the case, the following suggestions may be helpful" (p. 53). Kroenke then goes on to advice doctors to explore attributions, define expectations, show empathy, be optimistic etc. In essence, Kroenke's advice is that doctors need to humor the patients until someone can find a "real" cause for the disease. This article is interesting because its whole point is to tell doctors how to handle something that is not a "real" (i.e. mechanically-based) disease; the very existence of this article demonstrates how important the DISEASE IS MECHANICAL BREAKDOWN metaphor is to medicine.

Treatment is repair or replacement

> Even today many of us have an unnatural but distinct penchant to repair and replace defective body parts, e.g. teeth, with precious metals. We already have in practical use entirely artificial heart valves heart pacemakers, blood vesels, hip joints, knees, articulated fingers, ankles, shoulder joints, arms and legs of different kinds, kidney machines, heart-lung machines, and such established veterans as contact lenses, hearing aids, and false teeth.
>
> (Scott, 1981; p. 42)

The MEDICINE IS A REPAIR BUSINESS metaphor maps the body as a broken machine; accordingly, treatment of the broken machine is mapped by repair or replacement.

> Human tissue is not the only material with which "spare parts" surgery is performed. Two other kinds of substances have been employed for repairing and replacing defective, diseased, or destroyed body parts: animal tissue; and material of neither

> human nor animal origin, such as wood, metal, mineral, and plastic.
>
> (Scott, 1981; p. 39)

Diseased organs are thought of as failed parts which need to be replaced. The dominant pathology text in medicine, for example, comments that "there is no satisfactory treatment for hepatic failure and coma when there is massive hepatic necrosis save for liver transplantation" (Cotran, Kumar, and Robbins, eds., 1989; p. 918).

Repair of the mechanical damage is sometimes possible. Some repair techniques are built into the body: "The body's attempts to heal damage induced by local injury begin very early in the process of inflammation and, in the end, result in repair and the replacement of dead or damaged cells by healthy cells" (Cotran, Kumar, and Robbins, eds., 1989; p. 71).

Other repair techniques are provided by medicine, particularly by surgery; reconstructive surgery, for example, rebuilds skin and bone structure damaged in accidents or by disease. Certain organ systems are particularly suited to repairs; the cardiovascular system is a good example. Cardiac surgeons can put in mechanical implants such as pacemakers to recreate normal heart rhythm; cardiologists repair coronary blood flow problems by using angioplasty to clear the atherosclerotic blockage.

An appeal to the TREATMENT IS REPAIR OR REPLACEMENT metaphor seems to have motivated public health campaigns in America since the 1920s. According to sociologist Stanley Reiser, these campaigns featured

> slogans such as ""Have a Health Examination on your

> Birthday," and posters carrying such messages as "Your body is a wonderful machine. You own and operate it. You can't buy new lungs and heart when your own are worn out. Let a doctor overhaul you once a year."
> (Reiser, 1978; p. 217)

Payer has pointed out the contradiction in this appeal; if we think of the body as a machine, this merely encourages us to believe we can buy new parts for it. The increasingly common practice of organ transplants reinforces this idea.

This mapping of the repair business metaphor may inform the American medical bias towards surgery. Most doctors would agree that surgery is the highest paying and most prestigious specialty within medicine. (Duffy, 1979). This primacy of place makes perfect sense in a conceptual system built on a metaphor which sees treatment in terms of a mechanical source domain; surgery is the most mechanical treatment available to medicine.

The doctor is a technician

Hospital administrators are by no means the only persons within medicine who operate from a perspective based on the MEDICINE IS A REPAIR BUSINESS metaphor. As Kleinman says, "the helping professions...are oriented to treat suffering as a problem of mechanical breakdown requiring a technical fix" (Kleinman, 1988; p. 29). Many doctors unconsciously conceptualize themselves as those who "fix" the human machines.

> I did everything I could do medically, and we got him to an emergency room, but I couldn't bring my dad back. I had been trained to be the great fixer, a medical star, but I couldn't save my father, whom I loved more than any person in my life.
> (Pekkanen, ed., 1988; p. 98)

Certain medical specialties seem to fit better with this machine system of

metaphors than others. For example, Richard Selzer has written a book about his medical career entitled *Taking the World in For Repairs*(Selzer, 1986). No one would be surprised to find that Selzer is a surgeon; patients and doctors alike seem to think of surgery as a repair business and surgeons as technicians.

Obviously, the repair business metaphor affects how doctors experience their jobs. For example, a quote from the chronic fatigue syndrome article mentioned earlier reflects an intriguing element of the modern medical conceptual system, the view that treatment given in the absence of a known mechanism of disease is unsatisfying to both doctor and patient: "Because the exact cause of chronic fatigue syndrome is still unknown, management can be a frustrating proposition for both patient and physician" (Kroenke, 1991; p. 44).

The goal of repairing a machine is to make it "as good as new"; if the cause of the problem can't be found, then the machine can't be fixed, and it is scrapped. No value exists in preserving the machine if it functions imperfectly. The goal is not to prolong the machine's life or to improve the machine's experience, but to find the cause of damage and restore function. Thus the motivation for comments like Kroenke's comes from mapping this kind of knowledge about repair businesses onto medicine; in today's medical conceptual system, caring for a patient with a non-mechanically conceptualized disease is inherently unsatisfying.

It is important to note that lack of causal knowledge does not prevent care in other spheres. Parents, for example, are expected to know how to take care of

sick children, even if they don't know exactly what is causing the disease; even medicine itself used to take care of patients in the absence of knowledge about the cause of the diseases. Thus the expectation of total mechanistic knowledge about a disease is a relatively recent development in medicine, linked to the MEDICINE IS A REPAIR BUSINESS metaphor.

The quality of doctors' professional lives is not unaffected by the metaphor. The repair business metaphor partly justifies the difficult and unpredictable call schedules which doctors endure; these schedules resemble factory workers' shifts more than the schedules of other professionals with similar years of training. Technicians whose work is fixing mere machines do not need to have privileged, convenient schedules; the expectation is that they should work in schedules that can get the job done efficiently and cost-effectively.

Moreover, if medicine is conceptualized as a repair business, then some other field must take on the responsibility of dealing with the human elements of the patient, as the community relations director quoted earlier suggests. Some doctors are eager to embrace this sort of separation of technical medicine from psychosocial aspects. Consider the following description of clinical practice by one doctor Kleinman interviews:

> The more I get away from it, the more I realize I was happiest when there were no calls to family members, no listening all the time to people complain. Everyone seems to want something from me. I feel the need to protect myself, my involvement with patients. If I could only do, just do the cognitive side and leave the emotions, the family, the whole mess to someone else.
>
> (Kleinman, 1988; p. 214)

This doctor would like to be left to the medical repair business, left alone to fix the problems his patients come in with without worrying about "hand-holding" or "consoling." His mechanistic viewpoint even emerges in his description of the psychosocial aspects of medicine as "the whole mess." This doctor has clearly has a machine metaphor for the body and a repair business metaphor for his own job; the entailment of this system of metaphors is that he expects a machine-like, enforceable tidiness to medicine. Where medicine diverges from that expectation, the doctor is dissatisfied.

Another important entailment of the metaphor MEDICINE IS A REPAIR BUSINESS concerns the relationship of doctors to administration. This system of metaphors sets up certain priorities and a very different hierarchy within the hospital from the situation in which doctors are the bosses. If doctors are simply technicians repairing broken machines, then the administration is the boss, the upper management of the repair business.

> The children's hospital where I work used to be run by a doctor; now it's run by businessmen. We used to advertise our excellence by publishing in journals, by teaching, and by presenting our studies at medical meetings. Now we do marketing.
>
> (Pekkanen, ed., 1988; p. 57)

In an entailment of the repair business metaphor, then, the administrators' priorities, profitability and efficient, successful business, become the priorities of medicine. Consider the words of one of the doctors Pekkanen interviewed:

> There is a calculated attempt on the part of hospitals and hospital administrators to run the show rather than allow the doctors to run it. The medibusiness is becoming like agribusiness and the military-industrial complex. It's getting bigger and bigger, and hospitals are becoming parts of chains. Everything is becoming more standardized and more mechanical, and the

> physician is becoming more of an employee, more of a mid-level person filling a slot rather than an independent agent who is the center of the medical care delivery system.
> (Pekkanen, ed., 1988; p. 293)

In a conceptual system structured by the repair business metaphor for medicine, medibusiness methods of achieving medibusiness priorities become the hospital's standard practice. For example, Cesarean section has become the most common surgical procedure performed in United States hospitals (Stafford, 1990; p. 511).

> While in 1970 only 5.5% of US deliveries were by cesarean section, the 1988 cesarean section rate was 24.7%. The National Center for Health Statistics has projected a cesarean section rate of 40% by the year 2000.
> (Stafford,1990; p. 511)

Birth is also more likely to occur by cesarean section in the United States than in Europe. "Of the nineteen countries compared, the U.S. had the highest cesarean rate," (McMillan, 1987; p. 386).

I suggest that one factor in this increase may be an increasing dependence on the priorities created by the MEDICINE IS A REPAIR BUSINESS metaphor. Cesareans fit into the repair half of the metaphor as well as into the business half. As childbirth falls more and more within the domain of medicine, it is increasingly seen as a mechanical breakdown, to be dealt with mechanically—in other words, with surgery. "Obstetrics/gynecology is a surgical specialty. It follows, then, that residents in this specialty need surgical experience" (Fisher, 1986; p. 57).

Moreover, dealing with childbirth in this mechanical way, by surgery, is a

better business proposition; a C-section is much quicker and more profitable for a doctor than spending 12 hours helping a woman deliver vaginally.

Medicine as a source domain

A final area of linguistic evidence for this system of conceptual metaphors is the area of medicine as a source domain, mapped onto target domains of fixing machines: FIXING MACHINES IS MEDICINE. Advertisements for car service shops demonstrate the superior techniques of their technicians by showing them listening to cars with stethoscopes. Many mechanics have recently taken to describing themselves as "car doctors." A mechanic opposite the U.C. Berkeley campus advertises as "Dr. Smog"; another in Pleasant Hill, California is called "Bug Doctor." A number of computer software programs have been developed with "medical" purposes: "Disk Doctor," for example, helps save data that is destroyed by a computer malfunction; others remove or prevent computer "viruses" from damaging the computer. Clearly, the way we conceptualize medicine must be quite similar to the way we conceptualize fixing machines, or we could not use medicine as a source domain for common metaphors like this.

PROBLEMS WITH THE METAPHOR

I believe THE MEDICINE IS A REPAIR BUSINESS metaphor is highly problematic in terms of the delivery of the kind of health care Americans today want. I will discuss these problems from two frames, first that of the patient, second that of the doctor.

The patient

If medicine is understood as a repair business, the human significance of the experience of being a patient is lost. The repair business system of conceptual metaphors ignores the patient's individual emotions and needs. Conceptualizations of disease as mechanical breakdown, the patient as a broken machine, and treatment as repair or replacement do not adequately fit actual human experience.

For example, Anatole Broyard, the former editor of the *New York Times Book Review*, has written an article about his experience of health care after being diagnosed with prostate cancer. As he points out, seeing illness as simple mechanical failure is inherently unsatisfying for patients; the metaphor distances them from their own conditions:

> It would be more satisfying to me, it would allow me to feel that I *owned* my illness, if my urologist were to say: "You know, you've beat the hell out of this prostate of yours. It looks like a worn-out baseball." Nobody wants an anonymous illness. I'd much rather think that I brought it on myself than that it was a mere accident of nature.
>
> It is only natural for a patient to feel some dismay at the changes brought about in his body by illness, and I wonder whether an innovative doctor—again, like Oliver Sacks—couldn't find a

> way to reconceptualize this situation. If only the patient could be allowed to see his illness as not so much a *failure* of his body as a natural consumption of it. Any reconciling idea would do. The doctor could say, "You've spent your self unselfishly, like a philanthropist who gives all his money away."
>
> (Broyard, 1990)

Moreover, the repair system of conceptual metaphors directly affects what patient and doctor can discuss. A machine does not experience pain, confusion, tiredness, or fear, all emotions typically involved in being sick. Accordingly, patients' use of the BODY IS A MACHINE metaphor is limited to initial descriptive statements in which patients may describe themselves as machines with broken parts: I'm just here for a tune-up/ I broke my leg/ Can you fix my heart?/ I've got bad lungs. As soon as patients begin to describe their subjective *experiences* of an illness, however, the metaphor cannot accomodate them. Patients and doctors who stick with the metaphor are thus limited to discussions of the physical in their communications. This leaves much to be desired in health care.

> The spiritual dimension of illness could not be banished, however, from the experience of the sick. Exclusive attention to healing of the body could not meet the needs for healing of the mind or spirit.
>
> (Suchman and Matthews, 1988; p. 126)

The doctor's expectations about treatment as mechanical repair may not coincide with the patient's expectations of treatment, which often involve the mind and spirit.

> The biomedical view of clinical reality, held by modern health professionals in developing as well as developed countries, assumes that biologic concerns are more basic, "real," clinically significant, and interesting than psychologic and sociocultural issues. Disease, not illness, is the chief concern; curing, not healing, is the chief objective.
>
> (Kleinman, Eisenberg, and Good, 1978; p. 255)

This biomedical view is enforced by means of the repair business metaphor. For example, in *A Woman In Residence*, a highly critical look at her obstetrics residency, Michelle Harrison describes a number of problems with the way women having cesareans are treated by modern American medicine. Her main criticism is the following:

> We act on the [fetal] monitor, not on the patient. A woman is moved along like a machine, with her uterus split open, and almost no control over what is going on.
> (Harrison, 1982; p. 96)

This mechanical management of birth is a natural outcome of a conceptual system of medicine based on the MEDICINE IS A REPAIR BUSINESS metaphor. Cesarean births fit well into this metaphor; they give the doctor a controlling, technician's role in what is conceptualized as a mechanical process. However, a view of birth as a mechanical process is extremely narrow and limiting, both to the physician delivering the baby and to the pregnant woman herself. The medical control comes at the expense of the patient; the pregnant woman's experience of birth becomes secondary to the medical goal of getting the baby out efficiently. Psychological and sociocultural issues around birth are de-emphasized by this metaphor, while the "real" biological processes become the target of medical intervention.

> Treatment oriented within this view emphasizes a technical "fix" rather than psychosocial management. It is less concerned with "meaning" than other forms of clinical care. It deals with the patient as a machine. Contrary to the usual belief of health professionals, this biomedical viewpoint is both culture-specific and value-laden: it is based upon particular Western explanatory models and value-orientations, which in turn provide a very special paradigm for how patients are regarded and treated (6, 7).
> (Kleinman, Eisenberg, and Good, 1978; p. 255)

What Kleinman calls a "special paradigm" is the conceptual system built upon and reinforced by the repair business metaphor. I have already touched on some of the problems with the repair half of the metaphor, which relies on Cartesian-based, mechanical, biomedical explanatory models and values. The business half of the MEDICINE IS A REPAIR BUSINESS metaphor, linked to modern American notions of a profit-oriented free economy, is also damaging to patient care.

Broyard points out that the "business as usual" attitude is a key conflict between doctor and patient in viewing the patient's situation:

> To most physicians, my illness is a routine incident in their rounds, while for me it's the crisis of my life. I would feel better if I had a doctor who at least perceived this incongruity.
> (Broyard, 1990)

Any illness, be it a minor health problem or a life-threatening condition, is a unique, special event in the life of the patient. "The patient is always on the brink of revelation, and he needs someone who can recognize it when it comes" (Broyard, 1990). This sort of need on the part of the patient is simply not accounted for by a repair business metaphor, and it is in sharp contrast to the expectations of a simple, quick fix set up by the doctor's metaphor.

Follow-up of an illness is also left unaccounted for by the repair business metaphor. A mechanic has no responsibility beyond fixing the problem at hand; a new part or a tune-up and the machine is as good as new. Moreover, once fixed, a machine is left alone until the next breakdown. This knowledge is mapped onto medicine in another problematic entailment. For example, a doctor practicing by this metaphor would not expect to be involved in a back

surgery patient's recovery; yet a patient recovering from lumbar laminectomy and discectomy has significant residual pain and weakness, needs physical therapy, needs help planning a new exercise regime, and needs reassurance as to the pace of recovery.

Unlike machines, human beings are not "fixed" once and for all; they do not recover from surgery without pain and distress, and they form intense human bonds with their physicians. For example, one back surgery patient found he was of no interest to his surgeon after his operation. He was crushed, because he expected to have a continuing therapeutic relationship with his physician "after everything we've been through together" (Kushner,1991; personal communication).

Human needs for a therapeutic medical relationship require a different model of physician-doctor relationship than a technician-machine interaction.

> I wouldn't demand a lot of my doctor's time; I just wish he would *brood* on my situation for perhaps five minutes, that he would give me his whole mind just once. I would like to think of him as going through my character, as he goes through my flesh, to get at my illness, for each man is ill in his own way. ...Just as he orders blood tests and bone scans of my body, I'd like my doctor to scan *me*, to grope for my spirit as well as my prostate.
>
> (Broyard, 1990)

Yet in a conceptual system built on the repair business metaphor, these human needs are not priorities. Follow-up is not considered to be a profitable way for a doctor to spend time; surgery and medical procedures receive the financial reward, not time spent groping for the spirit or talking with the

patient. Thus the repair business metaphor is perpetuated in modern American medicine.

Doctors

The prevalence of the repair business metaphor in medicine does not mean all doctors are happy with it. While doctors use the metaphor easily and unconsciously to describe their work, most are not comfortable with many of its entailments. For example, what one doctor referred to as the "whole mess" of families and emotions is exactly what makes medicine valuable for another.

> I work hard at keeping up with the latest developments. I want to be technically first rate. After all, that's what patients need. But that is only the mechanical aspect of care. I feel what really counts is the human aspect. That is both a lot tougher and a lot more rewarding. It is a great privilege being a healer. Entering patients' life worlds and listening to their pain, helping them make sense of their suffering, helping them to cope with the burden of disease—all that is what makes my work rewarding.
>
> (Kleinman, 1988; p. 213)

This doctor also uses the DOCTOR IS A TECHNICIAN metaphor, but wants more. He does not want to be just a mechanic; he wants to be connected emotionally to his patients. However, this is almost impossible in medicine today, structured as it is by the repair business metaphor:

> You know, it has gotten so bad, I sometimes find myself daydreaming that I am no longer in practice, but in some other field, not medicine. I told my kids: Don't, don't go into medicine. It has all changed. What they want is technicians or businessmen, not doctors.
>
> (Kleinman, 1988; p. 218)

The MEDICINE IS A REPAIR BUSINESS metaphor is as problematic for physicians as it is for patients. The unique meaning of being a doctor is lost if

that job is understood as being a technician.

> Doctors fear that medicine is losing its magic. They fear that it's going to become like plumbing or auto mechanics, that it will be just another trade. The feeling that what doctors do is magic has sustained most of them through their training and has kept them in medicine. It is extremely powerful.
>
> The magic comes from the fact that most doctors feel that what they do in medicine is special. Not just doctors, but nurses talk about this, too. We feel what we do means something, that we can make a difference in patients' lives or in the quality of life for the patient's family.
>
> (Pekkanen, ed., 1988; p. 297)

This is simply not the kind of medicine most doctors want to practice:

> Doctors like me, who are sustained by this sense of magic, fear it is becoming trivialized. We fear that what we do will no longer be valued or seen as special. We fear that we'll no longer strive for excellence. Instead of striving to become the best restaurant in town with the best French chef, we're all going to become McDonald's.
>
> (Pekkanen, ed., 1988; p. 297)

One particularly troubling entailment concerns doctors' hierarchical place in medicine. Mapped onto medicine, knowledge from the business source domain tells us that as technicians, doctors should work for someone else. This entailment has come to be a reality in medicine today, and doctors are finding they don't like it. As the editor of *M.D.: Doctors Talk About Themselves* says, "Doctor after doctor complained that he or she feels like a mid-level manager, a functionary carrying out the orders of others, instead of a professional whose judgment and experience are paramount" (Pekkanen, ed., 1988; p. 56).

As we will see in the next section, the hierarchy set up by MEDICINE IS A

REPAIR BUSINESS also conflicts with that created by the other primary metaphor for medicine, MEDICINE IS WAR. In this metaphoric system, doctors see themselves as heroic figures battling death and disease, on the top of the military hierarchy. These conflicting self-conceptualizations add to the difficulties doctors face in today's medical environment.

"Helen McNaughton," a psychiatrist profiled by Dr. Kleinman, summarizes the problems facing medicine in her description of the West Coast health maintenance organization (HMO) in which she works. In essence, she describes the conflict between the current reality of a medicine dependent upon a repair business metaphor and that which patients and doctors would prefer. She first describes her discomfort with the business elements of medicine:

> Let's just consider care. Now care is supposed to be what the doctor does. But well, care has become a commodity. It is a "product" of the HMO. They measure it, cost-analyze it, and market it. It can be overused or underpriced. You, the doctor, dispense it. Y'all must not provide too much of it. Yeah, the less, in fact, the better...Cost is everything. The images, the very language is financial. Well, darn it, good care is expensive. Money talk doesn't accurately describe care; it distorts it.
>
> (Kleinman, 1988; p. 219)

Dr. McNaughton goes on to describe her frustration with the mechanical side of what medicine has become:

> When I learned to become a psychiatrist, I learned to practice the best care I am capable of giving. It was a magical experience, like an artist in an atelier slowly working to perfect her work. It was — enchanting. Now it's disenchantment, like being a worker in a factory turning out a standardized assembly-line product.
>
> (Kleinman, 1988; p. 219)

The words of these doctors criticizing the medicine they practice are not just poetic descriptions of medicine; these words describe the real situation today in terms of a dominant metaphor, MEDICINE IS A REPAIR BUSINESS. These doctors' dissatisfactions are directly linked to medicine practiced according to this metaphor.

ETHICAL DILEMMAS

The repair business metaphor also creates several ethical and policy dilemmas.

Prolonging life

One ethical dilemma arising out of the repair business system of metaphors involves medical decisions to prolong life. What do we try to fix and when do we stop trying to fix it? The repair business metaphor can play a direct role in questions like these. For example, the metaphor can only account for human death in terms of mechanical failure. One entailment of this mapping is to put decisions about life and death into the hands of the doctor; the technician makes the decision about when a machine can no longer function. Another entailment of this mapping is that decisions about prolonging patients' lives come to be based on the physical status of the patient, as opposed to the meanings patients derive from that physical status. Physicians are driven by the mechanical, functional condition of the patient rather than by the emotional or psychological state of the patient, yet both are important.

Consider the story one doctor tells about a patient who had become critically ill suddenly, and then lapsed into a coma. After a year, she finally came out of the coma, only to find she was paralyzed from the neck down.

> Although she couldn't vocalize words, she could mouth them, so we got a lip reader. The first thing she told us was that she wanted to die.
>
> In the meantime, her family had stopped coming to see her because they couldn't stand it. She was in limbo, neither alive

> nor dead, unable to move. She occasionally got an infection; when she did, we treated her because there was no way not to at that point...
>
> Month after month, she continued to tell us that she wanted to die. I don't want to inflict harm on people, but it was perfectly obvious that if I were in her situation, I would want to be dead, too. I knew her wish to die was rational, but there was no way I could kill her ethically. I can't do that as a physician, I can't do that as a human being. It was a horrible dilemma.
>
> (Pekkanen, 1988; p. 199)

The doctor admits his patient is in limbo, neither alive nor dead, and he admits she has no reason to live. Yet he feels he must prolong her physical life; there was "no way" he could let her die. The patient's family eventually asks the hospital to take her off life support, but this doctor refuses and threatens to take them to court. I suggest that his unconscious conceptualization of his job as a technician and of the patient as a broken machine directly affects this decision. He prolongs her life artificially *because she is still functioning physically* within this limited medical environment; while she is not emotionally, spiritually, or mentally "alive," she is alive in mechanical terms. Since this doctor understands his job as saving lives, and understands life in primarily mechanical terms, he cannot ethically justify any failure to prolong life under these circumstances.

> She was bedridden like this for five years until she suffered a circulatory collapse, which was inevitable. I made the decision not to resuscitate as her condition grew more unstable. I felt I was carrying out her wishes.
>
> (Pekkanen, 1988; p. 199)

Why does this doctor suddenly feel he can carry out his patient's wishes by allowing her to die? Again, I suggest that unconscious use of the repair business system of metaphors influences his decision. The doctor can now allow his patient to die because she has finally ceased to function

mechanically in the environment in which she found herself; her "circulatory collapse" was a mechanical failure which the doctor could accept as death. Only under these circumstances could he feel he was ethically correct in not prolonging her life.

Another doctor points out a similar situation involving care for a premature baby in the neonatology unit.

> What we did for this baby epitomizes something that we sometimes do in the intensive care nursery that I hate...I knew it wasn't worth it. Even if he did survive, he wouldn't grow up to lead a prõductive life. It was doubtful that he would even recognize who his mother was or realize it was a sunny day.
>
> It was pathetic to see this baby. It became a mechanical exercise to save him because we lost sight of him. There was nothing about him that resembeld a baby anymore, in appearance or activity.
> (Pekkanen, 1988; p. 213)

This doctor is conscious of the importance of the machine metaphor. As he describes, the point of this baby's care was to prolong mechanical function; maintaining the baby's individual humanity is not a goal, and thus the absence of the baby as a person is no reason to stop care. Again, this doctor can ethically allow this baby to die only by allowing mechanical failure to take place; with the mother's permission, the baby is taken off the ventilator. Its death under these circumstances is considered acceptable within medicine; the medical repair business has done what it can.

The stories of both of these doctors illustrate a serious problem in medicine which is directly linked to the power and prevalence of the repair business metaphor. Both doctors know intuitively that the right thing to do is let their

patients die. Yet both know that under the ethical guidelines medicine has set up, they cannot do so unless the patient dies "mechanically."

Medicine has become ethically linked to the repair business metaphor; it is affecting medical decision-making in an area vitally important to patients, their right to die when they choose. The problem is that the medical practice linked to this metaphor is inherently in conflict with patients' desires. The metaphor limits evaluations of life to mechanical, functional grounds, but patients may evaluate their lives in terms of quality of life, pain, or emotional distress; clearly, the medical conceptual system has no room for these sorts of factors. Until this sort of deep-seated, unconscious conceptual system is brought forward and examined, patients and doctors will continue to talk past each other, and patients and doctors alike will continue to torture themselves as life is prolonged at any cost.

Spare parts priorities

> A visit to the kidney dialysis ward of any hospital or a talk with the recipient of a successful kidney transplant will prove the point beyond all doubt. How can a comparison be made between a healthy, energetic person leading a normal life, and the person he was, continually sick and spending six hours at a time three days a week in a hospital attached to a machine through permanent openings in his wrist veins?
>
> (Scott, 1981; p. 30)

Perhaps the greatest benefits of the repair business system of metaphors come from the treatment options which have emerged from a conceptual system based on this system: transplants and tissue grafts. The use of human tissues and organs for medical education and research are also benefits which are permitted by a conceptual system rooted in a view of the body as a machine and of medicine as a repair business.

However, one potentially dangerous entailment of the MEDICINE IS A REPAIR BUSINESS metaphor is that human organs and tissues can be conceptualized as spare parts with a commercial value. We already speak of repositories for human organs and tissues for transplant in economic terms, as "tissue banks." In his book *The Body As Property*, Russell Scott points out some of the social and philosophical complications of such a metaphor:

> It is well within contemplation that as medicine continues to find greater and greater uses for human tissues, we will come to see these claims upon the dead assuming the aspect of a public entitlement. If this happened, the human body would acquire some of the attitudes of property. The possibility of such a climate of opinion makes it necessary to reexamine the strength of our beliefs in personal autonomy and individual freedom.
>
> (Scott, 1981; p. 24)

Moreover, a spare parts mentality creates its own ethical problems; shortages are inevitable, and the question of who receives available organs is troubling. The embrace of the repair business metaphor poses a further dilemma for health policy on a large scale. Our conceptual preference for repair and replacement biases medical practice in favor of surgery and organ transplants. This is reinforced by the DOCTORS ARE TECHNICIANS metaphor; the most technical doctors, radiologists, surgeons, and other doctors who deal with the patient's emotions the least, come to be the best examples of a doctor. The current socioeconomic hierarchy of doctors reflects and perpetuates this bias.

Yet the high technology treatments practiced by today's repair business medicine is costly and not necessarily effective. "Compared with other industrialized nations, we are spending more for health care but our health is

worse" (Rice, 1991; p. 294). Surgery and organ transplants are extremely expensive methods of care.

> For example, the technology and professional skills that come into play in the modern diagnosis and treatment of acute myocardial infarction use many times the resources that were considered appropriate for this condition 50 years ago...This considerable built-in cost has to be a downside of modern technology and the higher standard of health and living that it makes possible.
>
> (Watts, 1991; p. 562)

A shift in American medical policy priorities towards prevention is often touted as a potential solution to the health care crisis. Improved prenatal care, for example, has been suggested as a viable option for bringing down spiralling health care costs (Rice, 1991). Accordingly, a number of organizations have developed recommendations for the preventive services which physicians should offer, including the American Cancer Society, the Canadian Task Force on the Periodic Health Examination, the National Cancer Institute, and the American College of Physicians. Suggested preventive medicine procedures include Papanicolaou tests, smoking cessation interventions, mammograms, and fecal occult blood tests (Pommerenke and Weed, 1991).

However, a recent review of research on physician compliance with prevention guidelines demonstrates that physicians do not do very well at following these recommendations (Pommerenke and Weed, 1991; Kottke et al., 1987).

> Awareness of the extent and significance of compliance problems is hampered by the tendency of physicians to be overly optimistic in estimating the number of preventive health services they perform....Fundamental to understanding physician compliance is an awareness of the discrepancy between

> the physician's knowledge, perception and beliefs, and the actual performance of preventive medicine activities.
> (Pommerenke and Weed, p. 561)

Physician knowledge, perception, beliefs, and performance are all linked to a conceptual system based on the repair business metaphor. Prevention can never become deeply rooted in American medicine as long as we operate out of this conceptual system. As long as we think of patients as machines, repairing them and buying new parts for them will always seem most appropriate, and we will reward doctors and research which further that end. All the policy recommendations in the world will not change this, because prevention is not a priority which emerges from this metaphor. As long as the repair business informs medical thinking, significant shifts in policy and in physician behavior will be almost impossible to achieve.

CASE STUDIES

The remainder of this analysis of the MEDICINE IS A REPAIR BUSINESS metaphor consists of three case studies.

Case Study 1: MENOPAUSE IS OVARIAN FAILURE

The importance and power of the repair business system of metaphors can be seen by a look at a medical problem which is not strictly disease. For example, menopause is also identified as a mechanical breakdown; it is seen by medicine as "ovarian failure," as if the ovaries were a machine-part which had given out and needs replacement. *Cecil's Essentials of Medicine,* a classic text for teaching introductory clinical medicine, has this to say of menopause:

> The menopause refers to the cessation of menses. The mean age of spontaneous menopause is currently 50 years, although generally there is a transitional phase of ovarian failure over 6 to 18 months during the perimenopausal period. Pituitary gonadotropins are secreted excessively as progressive ovarian (follicular) failure reduces estrogen secretion. Measurement of serum follicle-stimulating hormone (FSH) is the single best test to detect ovarian failure (FSH > 50mIU/ml).
>
> (Andreoli et al., eds., 1990; p. 486)

What causes this ovarian failure? The cause is also seen in mechanical terms. According to Guyton's *Textbook of Medical Physiology,* the "cause of the menopause is 'burning out' of the ovaries" (Guyton, 1986; p. 979). Seeing menopause as mechanical failure prompts considerations of "hormone replacement" as treatment for the condition. The following passage from a syllabus for introductory clinical medicine makes clear the mechanical conceptualization of menopause and its treatment:

> I believe it is more important to consider the menopause as a

> deficiency state rather than being physiologic. If one assumes this hypothesis, the management becomes more logical and estrogen replacement therapy would encounter considerably less resistance by both physicians and patients. If a patient becomes hypothyroid no one would argue against thyroid replacement. If one becomes diabetic we certainly do not withold insulin because the diabetes occurs spontaneously. Why is there such resistance to replacing ovarian hormones in the face of overt ovarian failure?
>
> One obvious reason was that there was no estrogen available for replacement until the 1930's so one necessarily resigned oneself to the inevitable sequellae of the menopause just as diabetics needing insulin generally died before the discovery of insulin.
> (Nelson, 1990; p. 1)

Entailments of the machine metaphor are responsible for this sort of thinking. Some of the knowledge that we have about machines is mapped onto the body; in this case, the implication is that ovaries should always function in the same way, much as a fuel pump is expected to continue to provide a constant flow of fuel to the carburetor. If ovaries stop functioning as they have functioned, they have failed; the machine is broken.

The goal of treatment is also carried over from the source domain; the doctor must repair the broken machine, make it work the way it worked ten years ago. Now that the proper replacement "part" is available (estrogen), it should be used. Medicine does not see menopause as a normal physiological event which should be accepted; accordingly, the medical goal is *not* to determine what problems the individual patient may have dealing with the physical changes that have occurred, nor to determine how those problems might be individually dealt with.

Indeed, this mechanical view of menopausal women is inherently

impersonal. All women are viewed as having the same mechanical problem, which should be handled in essentially the same way in most cases; estrogen replacement therapy would be the rule, not the exception. While estimates vary, Nelson suggests that "it appears that nearly 80% of the postmenopausal women in the U.S. should be on minimum dosage cyclic estrogen-progestin replacement therapy for life" (Nelson, 1990; p. 7).

This mechanical way of thinking about menopause (or any "disease") may not necessarily correlate with the patient's way of thinking. In the passage above, Nelson seems to suggest that patients need to be convinced of his point. As he says later, "Patients tend to resist the idea of resuming menstrual cycles after the menopause unless they are well informed" (Nelson, 1990; p. 1).

In order for patients to be what Nelson calls "well informed," they may need to change conceptual models of disease entirely. Many women may see cessation of menstrual cycles as a major, liberating achievement in their lives; overcoming their "resistance" might mean converting them to conceptualize themselves as broken machines, needing replacement parts. This may not be an optimal outcome. Given the power of medicine in American society, the medical concept of menopause as ovarian failure may also play a role in the psychological difficulties many American women already encounter around menopause. As Kleinman points out, "women of most other cultures pass through menopause with few serious complaints and no conception of this life transition as an illness" (Kleinman, 1988; p. 24). It seems likely that these cultures conceptualize menopause in terms other than failure, terms which

may be less psychologically damaging for women.

It is important to note that the concept of menopause as ovarian failure is not some externally-defined, objective truth; menopause does not *have* to be conceptualized as mechanical failure. This view is simply an example of metaphorical thinking, rooted in a long tradition of seeing the body as a machine. Indeed, since menopause is an event that occurs in *all* women, its occurrence could well be seen as evidence of successful life stage progress, an indication of good health.

Thinking of menopause in this way sets up completely new priorities for medicine. Other alternatives for treatment of the problems menopausal women experience now become viable; instead of fixing the mechanical breakdown, the goal would be to tailor an individual program to deal with each woman's problems, from hot flashes to osteoporosis. The risks of uterine and breast cancer involved in replacement therapy might be weighed differently when that therapy is not the only option, and replacement therapy might become the exception to treatment, not the rule.

Obviously estrogen replacement therapy has its benefits as well as its risks; my point here is not to argue over the merits of treatment, nor to dismiss menopause as being without problems. My point is simply to use the concept of menopause to demonstrate that metaphor really can affect medicine's assumptions and priorities; the MEDICINE IS A REPAIR BUSINESS metaphor directly affects the way medicine thinks about and deals with menopause.

Case Study 2: THE MIND IS A MACHINE

> Investigations of the causal factors associated with mental illness have provided most of the current biological theories of psychiatric illness. These models have largely been derived from psychopharmacological studies and have focused on abnormalities at the level of neurotransmitters and receptors [Snyder, 1982]. The implicated neuronal systems are widely distributed within the brain and control complex sets of neuronal circuits [Bloom, 1980].
>
> (Volkow, Brodie, and Gomez-Mont, 1985; p. 312)

The picture of the brain and of mental illness painted by this passage is strictly mechanical; the brain is conceptualized as a series of electric circuits, and mental illness is conceptualized as failed mechanical functions, neurotransmission and reception. Mental illness can be seen as mechanical dysfunction and psychiatry as a repair business because of an understanding dependent upon a special case of the BODY IS A MACHINE metaphor, THE MIND IS A MACHINE. Examples of this metaphor are common in everyday language: He was grinding away on that problem for hours/ My mind just isn't working today/ Her French is a little rusty/ We've been working on this paper all day and we're running out of steam.

As Payer points out, "Americans separate the mind and the body, but tend to prefer the body, justifying the mind in bodily terms" (Payer, 1988; p. 151). Cognitive linguist Eve Sweetser has examined this conceptualization of the mind in bodily terms; she describes this as the mind-as-body metaphor (Sweetser, 1984). This underlying metaphor may motivate the MIND IS A MACHINE metaphor, since we already conceptualize the body as a machine. By transitivity, if the mind is understood in terms of the body, and the body

in terms of a machine, then the mind can be understood in terms of a machine.

In *Freud and Man's Soul*, Bruno Bettelheim comments that the expectations for psychiatry are derived from expectations about treating the body.

> In the United States, of course, "the cure of mental illness" has been seen as the main task of psychoanalysis, just as the curing of bodily illness is that of medicine. It is expected that anyone undergoing psychoanalysis will achieve tangible results—the kind of results the physician achieves for the body—rather than a deeper understanding of himself and greater control of his life.
> (Bettelheim, 1983; p. 40)

Certainly Americans seem to be able to think of mental illness as something a doctor can "fix." This starts at an early age.

> A little boy inquired as to what was wrong with Brad. When told that Brad's brain didn't work real well, he advised us to take him right back to the hospital and have it fixed.
> (Cantwell, 1988; p. 43)

Some psychiatrists also see themselves as technicians. Janet Malcolm, in *Psychoanalysis: The Impossible Profession*, quotes her analyst as saying,

> Analysis isn't intellectual. It isn't moral. It isn't educational. It's an operation. It rearranges things inside the mind the way surgery rearranges things inside the body—even the way an automobile mechanic rearranges things under the hood of the car.
> (Malcolm, 1982; cited in Payer, 1988)

In her controversial book, *In the Freud Archives*, Malcolm profiles another psychiatrist, Jeffrey Masson. Masson has accused Freud of dishonesty about his seduction theory, but his accusations have not been welcomed by the field of psychiatry. According to Malcolm, Masson uses the PSYCHIATRY IS A

REPAIR BUSINESS metaphor to describe what would happen if his field admitted Masson was right:

> "They would have to recall every patient since 1901. It would be like the Pinto."
> (Malcolm, 1983; cited in Payer, 1988)

That a specialty like psychiatry, presumably oriented towards emotions and unique human qualities, could embrace this mechanical system of metaphors is some indication of the power of the repair business metaphor in medicine. In fact, part of the motivation for American psychiatry's embrace of the machine metaphor may be its own search for justification in "a country that was not given to soul searching" (Payer, 1988; p. 151). Where psychiatry does not meet the standards created by a repair business metaphor, psychiatry is considered to be problematic. For instance, one of the main entailments of the repair business metaphor is that evaluations of disease are performed by the doctor/technician based on mechanical tests of function. This is not often possible in psychiatry, as the authors of an article on PET scanners in psychiatry disparagingly note:

> Current psychiatric nosology is based on the recognition of a set of clinical manifestations of a "psychological nature, which may include ideation, reality testing, affects, and purposeful behaviors. The nosological entities thus derived are a reflection of the appraisal of an interviewer, the patient's history, and his subjective report [Kendell and Brochingtol, 1980].
> (Volkow, Brodie, Gomez-Mont, pp. 312-13)

This subjective, psychological focus simply does not fit into the repair business metaphor for medicine, and is typically seen as a weakness of psychiatry.

> Psychiatry has been hindered by diagnostic difficulties and the lack of objective validation of clear boundaries between disease

> entities. Two major goals of research on psychiatric patients are to identify homogeneous populations and accurately delineate clinical syndromes using valid, reliable criteria.
> (Volkow, Brodie, Gomez-Mont, 1985; p. 322)

Perhaps as a result of this criticism, psychiatry often highlights any similarities to the more powerful, body-oriented specialties in medicine. According to a study on medical education by Thomas Johnson, psychiatrists tell students

> that psychiatric diagnostic techniques are thoroughly systematic, rational, and scientific. In fact, when teaching them to students psychiatric attendings often compare their own diagnostic technologies with those of biomedical specialists. For example, "The mental status evaluation is just like the workup for a heart murmur...don't cardiologists teach you to auscultate (listen to the heart with a stethoscope) the heart sounds systematically?...there is a logical sequence of steps in both assessments!"
> (Johnson, 1986; p. 965)

Here, the professor suggests that the workup to look for mental illness is analagous to a workup examining the physical function of the heart.

Mechanisms legitimate disease in medicine, and psychiatry has attempted to demonstrate the mechanisms for the existence of diseases of the mind. Unfortunately, as the pre-eminent biomedical textbook on the brain comments, "there are as yet few psychiatric disorders in which the clinical diagnosis has been correlated with demonstrable pathology" (Kandel and Schwartz, 1985; p. 705).

Those diseases which do have demonstrable physiological pathology are the most glamorous areas in which to work: "The search for the causes of

schizophrenia is at present one of the most exciting in psychiatric research. For many years, clinicians and researchers have suspected that schizophrenia is caused by a genetic abnormality" (Kandel and Schwartz, 1985; p. 706). In other words, schizophrenia research is exciting not because the subject is intriguing or the answers help humanity; rather, it is exciting because medical scientists think they can demonstrate that it has a physiological cause, an excess of dopaminergic transmission which may be genetically based.

Recent psychiatric research in neurochemistry and neuroendocrinology has successfully identified chemical mechanisms in the etiology of mental illness and found pharmacological treatments for those diseases, bringing psychiatry more into the fold of medicine. "Indeed, biological psychiatry is a sharply ascendent interest area within the discipline, has made revolutionary advances in the understanding of neurobiology, and is seen by many psychiatrists as the key to moving psychiatry from the periphery of medicine" (Johnson, 1986; p. 966). Nonetheless, psychiatry still stands alone.

> Yet, despite both preclinical and clinical involvement, psychiatry remains perhaps the most peripheral specialty in medicine. Not only do other medica specialists denigrate psychiatry, but through them students also are clearly socialized to view psychiatry as peripheral
> (Johnson, 1986; p. 963)

Studies show that fewer and fewer students are choosing psychiatry as a career, only 2-3% in the 1980's vs. 7% in the 1960s. Moreover, students devalue psychiatry as they progress through medical school; many more students start out with an interest in psychiatry residencies than actually take those residencies (Johnson, 1986). Students see professors of psychiatry as less competent than surgeons or internists, and recall psychiatry professors as

influential much less than professors in other areas (Johnson, 1986).

Those physicians that do end up as psychiatrists are increasingly calling their field by names with suffixes and prefixes closely allied with hard sciences: psycho*neurology*, *neuro*psychiatry, psycho*immunology*. Even their diagnostic techniques are coming to be as mechanical as possible, linking psychiatrists to the repair business tradition of the rest of medicine. Here, for example, the authors argue that positron emission tomography can help answer etiological questions about mental illness and improve psychiatry's diagnostic and therapeutic abilities.

> PET offers a unique technique for monitoring the regional biochemical activity that is associated with the different "brain states" and "brain traits" of normal subjects and psychiatric patients.
>
> (Volkow, Brodie, Gomez-Mont, 1985; p. 311)

When this technique fails to demonstrate a physiological difference, the problem is rationalized. The assumption is that mental illness *must* be manifested by physical breakdown at some level; the only difficulty lies in the technician's diagnostic methods for locating the dysfunction:

> Cerebral blood flow was measured by the nitrous oxide technique. Brain metabolism was estimated from the product of blood flow times the arterio-venous oxygen difference. The whole-brain oxygen utilization values of the schizophrenics were not different from those obtained in the normal young male controls. The authors suggested that their negative results might have been due to the study method's insensitivity to regional variations in metabolic rate.
>
> (Volkow, Brodie, Gomez-Mont, 1985; p. 313)

In the introduction to a popular introductory text, *Review of General Psychiatry*, Howard Goldman writes an apology for psychiatry's differences

from more physiologically-based areas of medicine. He begins with this defensive passage:

> *Review of General Psychiatry* undertakes to examine and discuss the 2 major domains of the medical specialty field of psychiatry: mental disorder and individual behavior in health and sickness. Both areas are characterized by a degree of scientific uncertainty that may be puzzling to students drawn to medicine by the prospect of effecting cures by extirpating tumors or disrupting bacterial cell membrane formation. The patients being treated by psychiatrists are apt to have "idiopathic" disorders, "functional" disorders, whose causes are unknown and often cannot be corrected with instruments and drugs.
>
> (Goldman, 1988; p. 1)

The author refers to the problems in understanding and treating "functional" diseases; a "functional" disease, as opposed to an "organic" disease, has no clearly defined cause and no readily accomplished treatment. Examples of organic diseases include delirium and dementia; functional diseases include schizophrenia and affective disorder. In other medical contexts, the term "functional" refers to the normal, physiological activity of an organ or process. Ironically, "functional" is used to describe what might also be called "dysfunctional." In psychiatry, according to *Dorland's Illustrated Medical Dictionary*, the term means "affecting the function but not the structure, said of disturbances with no detectable organic cause; idiopathic" (Taylor, ed., 1988).

Functional diseases are more controversial, more likely to be dismissed as "not real," than organic diseases. The idea is that the "real" diseases have structural components; the machine is physically damaged. Organic diseases can be diagnosed by a doctor according to physiologic, identifiable changes; tests or imaging techniques can pinpoint a damaged part of the brain. In

contrast, diagnosis of "functional" diseases depend to a certain extent on the patient's perception, rather than on the doctor's technical assessment. However, even functional diseases can be defined more mechanically in order to make them more legitimate:

> Functional illnesses may merely share a lack of appropriate techniques to detect more subtle derangements. The description also sems to refect the dynamic interactive nature of brain processes. To speak of a disorder of function is to imply that there is a derangement in a physiological system. The term does not consider any of the possible mechanisms underlying the dysfunction.
>
> (Volkow, Brodie, Gomez-Mont, 1985; p. 322)

Even the term "functional" maps a mechanical dimension onto mental illness, emphasizing the brain's functioning rather than the patient's experience of an emotional problem. Perhaps the term "functional" is itself partly an unconscious appeal for legitimation, focusing attention on the elements of mental illness which fit it into the BODY IS A MACHINE metaphor so prevalent in the rest of medicine.

Psychiatric research priorities also attempt to legitimize psychiatry:

> A major focus of present-day research in psychiatry has been to identify etiological agents that fit a medical model of psychiatric illness. Experiments seeking pathophysiological indices that would permit objective classification of psychiatric illnesses have failed to reveal consistent abnormalities [Blass and Milne, 1977].
>
> (Volkow, Brodie, Gomez-Mont, 1985; p. 311)

Using THE MIND AS A MACHINE metaphor, psychiatry is clearly attempting to squeeze into today's mainstream American medicine. This is the kind of medicine in which practice is structured by the repair business metaphor with all its entailments, which certainly provides tremendous

motivation for the adoption of a similar repair business metaphor by psychiatry.

However, while this sort of metaphor confers a certain element of legitimacy on psychiatry, we have seen that it creates problems in patient care. Applications of the BODY IS A MACHINE metaphor to the mind directly affects decisions about treatment. "The judgment of appropriateness is influenced both by the condition of the patient and by the 'secondary gain' of mimicking the biomedical approach" (Johnson, 1986; p. 966). For example, decisions on drug treatment has been shown to be motivated as much to increase acceptance by students and non-psychiatric physicians as to care for patient needs.

Psychiatry currently faces a dilemma, one all medicine may soon face. Psychiatry can continue to try to be like the rest of medicine, which means it will think increasingly in terms of the repair business metaphor, or it can sacrifice current medical legitimacy and strike out in a new direction.

Case Study 3: THE HEART IS A PUMP

> Although this four-chambered muscular organ weighs less than a pound, it beats so steadily and powerfully that the force generated during its 40 million beats per year could lift its owner 100 miles above the earth. Even for a person of average fitness, the maximum output of blood from this remarkable organ is greater than the fluid output from a household faucet turned wide open.
>
> (McArdle, Katch, and Katch, 1981; p.197)

What organ does this passage describe? Most of us could easily identify it as the human heart, even though the only clues we are given are metaphorical, comparisons to a lifting force and a faucet. The normal human understanding of the heart seems to be in terms of chambers, beats, forces, and fluid outputs. In fact, if asked "What is the heart?" many people would understand the question to be functional and reply, "The heart is a pump."

Our understanding of a heart and a pump are so inextricably linked that *Webster's New Collegiate Dictionary* even lists "heart" as a one of its definitions for "pump" (Woolf, ed., 1977). This sort of understanding is by no means limited to laypeople. On the contrary, the biomedical conception of the human heart, its physiology, and its pathology are almost invariably explained through metaphor.

For example, if one looks under "pump" in the index of the definitive textbook of medicine, *Harrison's Principles of Internal Medicine*, one will find a series of references to "pump failure" and its classification, pathophysiology, and treatment (Braunwald et al., eds., 1987). The reader does not need to be a physician to guess that these pages will be found in the section on diseases of the cardiovascular system.

This metaphorical description of the heart as a pump is even more pervasive in basic physiology textbooks:

> Functionally, the heart may be viewed as two separate pumps. The hollow chambers that comprise the right side of the heart (right heart) perform two important functions: (1) receive blood returning from all parts of the body, and (2) pump blood to the lungs for aeration via the pulmonary circulation.
> (McArdle, Katch, and Katch, 1981; p.197)

I suggest that this biomedical understanding of the heart is another example of THE BODY IS A MACHINE metaphor, linked to the entire MEDICINE IS A REPAIR BUSINESS system of metaphors. THE HEART IS A PUMP is part of a larger metaphor; our current biological understanding of the structure and function of the mammalian cardiovascular system is dependent upon an understanding of the system as a problem in physics, specifically fluid dynamics. This can be seen in the following example:

> The cardiovascular system is a continuous vascular circuit consisting of a pump, a high-pressure distribution circuit, exchange vessels, and a low-pressure collection and return circuit.
> (McArdle, Katch, and Katch, 1981; p.197)

I will refer to this general conceptual metaphor as THE CARDIOVASCULAR SYSTEM IS A CLOSED SYSTEM OF FLUID DYNAMICS. Thus we have the following mappings:

Source Domain		Target Domain
A CLOSED SYSTEM OF FLUID DYNAMICS	---------->	THE CARDIOVASCULAR SYSTEM
A MECHANICAL PUMP	---------->	THE HEART
PIPES	---------->	BLOOD VESSELS

After a brief discussion of this metaphor's relationship to the general MEDICINE IS A REPAIR BUSINESS metaphor, I will discuss these mappings in more detail. I will pay particular attention to physiology and pathophysiology. Like any conceptual metaphor, the fluid dynamics source-to-target mapping highlights similarities and hides differences; nonetheless, discrepancies do exist between the fluid dynamics source domain and the cardiovascular system. I will point some of these discrepancies out along the way. Next, I will touch upon an interesting linguistic question posed by the medical conceptualization of the cardiovascular system: is this indeed a metaphor, or is it simply a definition? Finally, I will discuss the implications of the fluid dynamics system of metaphors for medical practice, and I will suggest an alternative metaphor that might better fit the aims of medicine.

Origins of the metaphor

In medicine this system of metaphors is so pervasive that it is difficult to imagine any other way of thinking about the cardiovascular system. Historically, however, this sort of understanding has not always been present. For centuries, the heart has been understood in Western European cultures as the seat of emotions, the location of the soul within the body. Not until Harvey's discovery that the blood "circulated" and Descartes declared the body a machine could this sort of metaphor begin to develop.

Does the fluid dynamics metaphor then originate in some more general machine metaphor, or is it unique to the cardiovascular system,? To answer this question, we must determine if any other organ or organ systems use similar physics metaphors to map a complex system of knowledge onto their

functions. The skin? The brain? The liver? None of these seem appropriate to a fluid dynamics metaphor.

The respiratory system is an important organ system that might logically be understood in terms of fluid dynamics, perhaps with the lungs as a pump. However, this metaphor is not a common one. Air is usually described on its own terms, not as a fluid within a tube; lung function, if metaphor is used at all, is conceptualized in terms of blowing up balloons. Certainly none of the entailments or extensions about arteries as pipes or springing a leak apply here. This may be because the physiological process of breathing has a voluntary component, unlike the beating of one's heart. Most children experiment with holding their breath, learning for themselves the physics of respiration; because knowledge of the respiratory system is experientially available to us, we don't need as complex a system of metaphors.

The gastrointestinal system is sometimes referred to by laypeople as "plumbing," but this metaphor has few logical entailments or extensions in our understanding of the GI system; the main entailment is that the intestine is the plumbing pipes and that the intestine, like plumbing, can be clogged. "Plumbing" does not explain the function of the stomach, the difference between the small and large intestine, the absorption by the intestine, etc. No pump is conceived of which runs the system, and no relations to other organ systems such as the endocrine system, the crucial factor in GI functioning, are implied by this metaphor. The plumbing reference seems to be more useful as a euphemistic metonymy, to avoid discussion of bowel movements and the like, than to actually understand the functioning of the GI system. Certainly few plumbing metaphors exist in physiology or medical textbooks.

The fluid dynamics metaphor does appear to be unique, probably because the cardiovascular system is unique. Whether the system works well or doesn't work, its effects are extremely noticeable, so a natural human interest exists in its function. The cardiovascular system is very different in this regard from more esoteric organs like the liver, spleen, gall bladder, or lymph nodes; some people don't even know they have these organs, let alone care how they work. However, the exact mechanism of the cardiovascular system's function is not experientially obvious, and is easiest understood metaphorically. As we will see in the next sections, the fluid dynamics metaphor can be very helpful in this regard.

The basic mappings

I have suggested that this metaphor maps the source domain of a fluid dynamics system of a pump and pipes onto the target domain of the heart and the vasculature. In a classical fluid dynamics view, this sort of system is a closed system. Thus this metaphor entails a conceptualization of the human cardiovascular system as closed. An understanding of the cardiovascular system as a closed system is useful for solving problems of pathophysiology involving pressure and forces; it is important to note, however, that this is somewhat misleading. Unlike a prototypical machine, the human body is constantly interacting with the outside environment. The human body takes in food, water, and air from and gives out waste directly to that environment; the body is dependent on external factors such as heat, cold, altitude, etc. As a part of the human body, the cardiovascular system is also subject to these external interactions and is thus *not* a closed system.

In the fluid dynamics metaphor, the vasculature is understood as a set of pipes containing fluid under pressure. A related mapping in this metaphor is thus the following:

Source Domain		Target Domain
FLUID IN PIPES	---------->	BLOOD

One of the entailments of this mapping is that the pipes and the fluid within them are understood in terms of classical fluid dynamics. We tend to think of the vasculature as rigid, cylindric tubes, carrying a homogeneous fluid. This sort of understanding is only accurate in a qualitative sense. First of all, blood vessels are not made of rigid, non-labile metal, but of living, respiring, dynamic cells. The vasculature has soft walls and is encased in the body, also with soft walls; in fact, we can actually see and palpate the pumping action of the heart through the vessels in many different places on the body, through a person's pulses. The fluid dynamics metaphor does not account for any of these living elements of the cardiovascular system.

Second, blood is not homogeneous. Unlike a mechanical pump, which typically circulates the same simple fluid unchanged and cannot modify that fluid, the heart circulates a complex and constantly changing fluid. Platelets, red blood cells, and leukocytes are constantly dying and being replaced; the pump and the pipes, the cardiovascular system itself, is in fact responsible for many of these changes. Again, these features of the target domain are hidden by the fluid dynamics metaphor. While this sort of understanding is useful in solving physiological problems concerning heart and blood pressures, the metaphor is in fact misleading when we need to think about other

hematological problems such as clotting disorders.

Next, let us consider another basic mapping:

Source Domain		Target Domain
A PUMP CREATES A FORCE WHICH PUMPS GAS OR FLUID FORWARD THROUGH PIPES	------->	THE HEART CREATES A FORCE WHICH PUMPS BLOOD FORWARD THROUGH BLOOD VESSELS

For example, a common expression about aerobic exercise is that it "really gets your heart pumping!" When the pipes are occluded, the heart must exert a greater pressure in order to maintain forward flow. A related basic mapping thus concerns obstruction:

Source Domain		Target Domain
NARROWED OR OCCLUDED PIPES SLOW DOWN FLOW	---------->	NARROWED OR OCCLUDED PIPES SLOW DOWN FLOW THROUGH BLOOD VESSELS

For example, a patient trying to understand her atherosclerosis might be told simply, "Your pipes are clogged," and she would in this way be able to conceptualize the more abstract concept of a cholesterol plaque adhering to the muscular walls of her arteries.

At this same level is the mapping which gives us the expression "I've sprung a leak. Patch me up, doc!" to describe bleeding and the wish to halt its flow.

Source Domain	Target Domain
A LEAK IS WHEN AIR OR FLUID ESCAPES FROM THE PIPES WHICH SHOULD CONTAIN IT --->	BLEEDING IS WHEN BLOOD ESCAPES FROM THE VESSELS WHICH SHOULD CONTAIN IT

An important entailment of this mapping is the expectation that bleeding can be stopped. The knowledge that leaks can be patched is carried over from the source domain and mapped onto the cardiovascular system.

Further mappings

Layer upon layer of coherent knowledge can be added within this system of metaphors, depending upon the expertise of the person thinking about the cardiovascular system. Someone wishing to pursue the subject further could use the same fluid dynamics metaphor to gain a deeper understanding of the cardiovascular system. The heart is still a pump and blood vessels are pipes, but more specifically, we have the following mapping:

Source Domain	Target Domain
LOW-PRESSURE, CAPACITANCE PIPES	---> VEINS
HIGH-PRESSURE PIPES	----------> ARTERIES

Certainly, these functional difference between arteries and veins are not crucial facts for most people to know. In the example earlier, the patient does not need to understand the difference between arteries and veins, whether in terms of their histology or just in terms of their functions; "pipes" carries enough information for her to comprehend her disease. However, a cardiologist is expected to understand how the subtle histologic differences between arteries and veins result in their functional differences, subtleties

which can be conveyed through the fluid dynamics metaphor in terms of capacitance vs. high pressure vessels.

The fluid dynamics metaphor remains useful at an even deeper level of understanding, explaining how the heart interacts with other organs. A cardiologist knows that the heart pump does not function completely independently, but is actually under the control of at least one other system. This is accounted for the following mapping:

Source Domain	Target Domain
A MECHANICAL PUMP IS UNDER THE CONTROL OF AN ELECTRICAL SYSTEM ---------->	THE CARDIOVASCULAR IS UNDER THE CONTROL OF AN ELECTRICAL SYSTEM

In the case of the cardiovascular system, this controlling electrical system is seen as the nervous system. While the nervous control of the heart is in fact manifested in terms of electrical conductance, charge, etc., the details cannot be fully mapped, however; for example, few electrical systems work like the heart, conducting impulses through the "walls" of the pump itself.

The characteristic rate in which the heart pumps, the heart beat, is understood in terms of the rate at which the heart creates a vacuum, sucking in gas or fluid, and expelling it forward through the pipes. In a machine, this rate is set by some external controller. A mechanical pump may also increase or decrease its rate of pumping on a gross scale in order to achieve a particular, prior-programmed level of functioning; it does this by responding to negative feedback from the workload generated. This knowledge is mapped onto the cardiovascular system by the fluid dynamics metaphor; we understand that

the heart will increase or decrease its rate of pumping depending on feedback from the blood pressure generated.

However, the cardiovascular system is much more sophisticated than any mechanical pump system ever built. The heart is not merely capable of achieving a single, programmed work-load, but also is capable of evaluating its own level of functioning, with the help of the endocrine and nervous systems, and modifying that functioning in extremely small increments to satisfy the body's constantly varying needs. Again, these features of the heart are not accounted for by the fluid dynamics metaphor.

Besides the nervous system, which adjusts cardiac output according to demand, many other organs constantly interact with the cardiovascular system to modify the blood and affect the heart rate: the kidney, changing salt and water levels; the liver, removing toxins; the endocrine system, adjusting blood sugar levels. Most of these relationships are hidden by the fluid dynamics metaphor.

One example of organ interaction which is consistent with the fluid dynamics metaphor is the relationship of the heart to the kidney. The kidney can be understood as the filter in a pumped system such as a swimming pool, filtering the blood for detritus, setting that aside and removing it as urine, and finally recirculating the purified blood back into the body.

"Taking a leak," a common metaphor for urinating, is probably an extension of the fluid dynamics metaphor at this level of understanding. Loss of any bodily fluid is understood as a leak. The difference is that unlike blood, which

we see as clearly meant to stay inside the pipes, urine is understood as a filtrate, a waste product with a history of a relationship to blood in the past. Therefore we say "take" a leak, using a voluntary, active verb to describe the event; the speaker intends to lose this fluid and does not view this loss as a problem. This understanding is opposed to that of "springing" a leak, which implies a potentially problematic event, one that is unexpected, involuntary, and in which the speaker plays a passive role.

Pathophysiology

Medicine also conceptualizes the pathophysiology of the cardiovascular system in terms of the fluid dynamics system of metaphors. Thus we have this mapping:

Source Domain		Target Domain
ABILITY OF PUMP TO MAINTAIN ADEQUATE OUTPUT	---------->	ABILITY OF HEART TO MEET NEEDS OF BODY WITH AN ADEQUATE CARDIAC OUTPUT (Heart rate x Stroke volume)
PUMP FAILURE	---------->	HEART FAILURE

For example, a textbook states that in heart failure, an elevation of "left ventricular filling pressure and pulmonary artery pressure are the characteristic hemodynamic findings, but it should be appreciated that these findings may result from a reduction of diastolic ventricular compliance (diastolic failure) and/or a reduction of stroke volume with secondary cardiac dilatation (systolic failure)" (Braunwald et al., eds., 1987; p. 989).

An entailment of this mapping is that normal cardiovascular function comes

to be conceptualized in terms of normal flow dynamics, which are laminar. An example of this entailment is a description in a physiology text:

> The flow of blood in blood vessels, like the flow of liquids in narrow rigid tubes, is normally laminar (streamline). Within the blood vessels, an infinitely thin layer of blood in contact with the wall of the vessel does not move. The next layer within the vessel has a small velocity, the next a higher velocity, and so forth, velocity being greatest in the center of the stream...Streamline flow is silent, but turbulent flow creates sounds.
>
> (McArdle, Katch, and Katch, 1981; p.197)

If normal flow dynamics are mapped onto the target domain of normal cardiovascular function, then abnormalities of cardiovascular function are mapped by abnormal fluid dynamics, which are non-laminar.

An example of this metaphoric understanding of abnormal cardiovascular function in terms of non-laminar flow appears in a textbook passage on cardiology: "Cardiac murmurs result from vibrations set up in the bloodstream and the surrounding heart and great vessels as a result of turbulent blood flow, the formation of eddies, and cavitation (bubble formation as a result of sudden decrease in pressure)" (Braunwald et al., eds., 1987; p. 869).

The term "cardiac murmur" in this example lets us know that the passage is describing the etiology of a dysfunctional heart. How do we know that the sound that a dysfunctional heart makes is a murmur, let alone that a dysfunctional heart makes a sound at all? This is an extension of the fluid-dynamics metaphor. Physics experiments have demonstrated that non-laminar flow is accompanied by turbulence, eddies, and cavitations. Doctors

don't have to be physicists to know this, however; normal experience tells us that this phenomenon of non-laminar flow is that which occurs in rivers, streams, and brooks, slowed and blocked by rocks, branches, and banks of varying shape and texture; this is the sort of flow which is described in phrases like murmuring stream, babbling brook, gurgling river. Even non-scientific knowledge would still understand a heart murmur to be evidence of flow like that in a river with large obstructions, not smooth and unobstructed but hesitant and turbulent.

Metaphor or definition?

The conceptualization of the entire cardiovascular system as a fluid dynamics system, with the heart as a pump and blood vessels as pipes, brings up an interesting linguistic question. This understanding is so ingrained in both general and medical knowledge that we may at first resist even viewing it as a metaphorical understanding. Does the distinction ultimately comes down to definitions? For example, let us look specifically at our understanding of the heart as a pump. If a pump is defined in general enough terms, a heart can then be defined as a pump; in this context, the heart would not be considered a metaphorical pump, but simply a particular kind of pump.

However, the existence of this sort of non-metaphoric understanding presupposes a definition of a pump so vague as to be essentially abstract; this sort of an abstract schema would be in distinct contrast to most people's fairly concrete and experiential understanding of a pump and its entailments. Moreover, a non-metaphoric understanding would not be particularly helpful in terms of conceptualizing something as complex and already abstract as the human heart.

Instead of this abstract definition of a pump, our understanding seems to reflect a basic-level image schema of a man-made machine, evolved in complexity but still related to the original water pump with a handle found on every street corner in early America. This prototypical pump was mechanical and worked by creating a momentary vacuum to suck water out of a well and then force it out into the waiting bucket.

I suggest that our understanding of a heart is thus metaphoric, not definitional; the understanding relies upon the *extraction* of certain generic, functional features from this image schema of a prototypical pump. These features are defined by the source domain functional characteristics and comprise the part of the heart's specific level schema which is parallel to that of many pumps - water pumps, respirators, pool filters, oil wells, etc. The HEART IS A PUMP metaphor focuses our attention on a particular part of the schema, in this case, the functional attributes of the heart and of the pump. The essential, biological structure of the heart is like that of the prototypical pump in that it has a variable-pressure chamber with the potential for creation of a force, the functional behavior important here.

Implications

In the process of conceptualizing the cardiovascular system as part of a classical fluid dynamics system, a mental simplification occurs, which naturally leaves a number of features of the cardiovascular system unaccounted for in the metaphoric mapping. This simplification can be a very practical way of looking at the heart; it is useful in basic physiological research, for example. The metaphor has also been helpful clinically,

providing the creative paradigm in which heart-valve replacement or transplants were thought up. However, the simplification offered by the fluid dynamics metaphor has a number of problematic implications for medical practice.

The most significant implication concerns modern medical conceptions of causation and treatment options for cardiovascular disease. Knowledge from the source domain suggests that the best way to fix a non-functioning pump and pipes would be to clean the pipes and replace the pump.

This knowledge is mapped directly onto medical ideas concerning treatment of heart disease; in America, we take our hearts in for repairs. The incidence of coronary bypass surgery in the United States is up to 7 times that found in many European countries. In theory, the purpose of the operation is to increase life-span in patients with heart disease. Studies have demonstrated that the operation did improve quality of life by reducing angina symptoms, and in a small subset of people with a particular sort of heart disease, the operation actually succeeded in prolonging life. In most people, however, the operation does *not* prolong life (Payer, 1988).

Why then does the procedure continue to be so popular in the United States? A major reason is that the operation appeals to the general conceptual metaphor MEDICINE IS A REPAIR BUSINESS, as well as to THE CARDIOVASCULAR SYSTEM IS A CLOSED SYSTEM OF FLUID DYNAMICS. Patients and doctors share the conceptualization of a heart as a pump and vessels as pipes; if one pipe is blocked, then the appropriate action

is to have a technician replace it with one that is not blocked. Even if the operation is not as successful as it should be in purely medical terms, it is very successful in satisfying the needs of the American public and the American medical system for appropriate action.

Even more important, the pump and fluid dynamics metaphors put an emphasis on mechanical problem-solving, exemplified by the attitude "If it ain't broke, don't fix it." Until recently, this attitude would have been an accurate representation of the position of much of medicine towards health problems. However, this does not do justice to recent emphases on health promotion and disease prevention, which encourage both physicians and patients to take early action in order to avoid later health problems; hardly the traditional attitude towards mechanical problem-solving.

A major breakthrough in the last ten years has been an understanding that lifestyle factors have an important role in the etiology of cardiovascular disease. The three primary risk factors for heart disease, cigarette smoking, high blood pressure, and cholesterol levels, have been recognized as being more amenable to modification and more within individual control than risk factors for almost any other disease; lifestyle features which can affect these include diet, exercise, and psychological profile (Braunwald et al., eds., 1987).

Unfortunately, the prevailing metaphor of THE HEART IS A PUMP and THE CARDIOVASCULAR SYSTEM IS A CLOSED SYSTEM OF FLUID DYNAMICS is not conducive to acquisition of this sort of prevention-oriented knowledge. As we have seen, entailments of the metaphor suggest that the cardiovascular

system is essentially a mechanical, self-regulating system; if the pump breaks down or a pipe leaks, it should be sent out to a technician to be fixed.

Cardiovascular function, as conceptualized through the fluid dynamics metaphor, is thus largely outside of the individual's conscious control. This understanding is simply incompatible with the idea that risk factor modification is a viable preventive measure in cardiovascular disease. Doctors are being told that individual patients can make lifestyle modifications which will significantly alter their own heart health; yet most medical knowledge about the cardiovascular system rests on an unconscious conceptual metaphor which *cannot account* for such concepts. Given this conflict, studies suggesting that today's doctors do poorly at cardiovascular disease prevention seem unsurprising (Kottke et al., 1987; Orlandi, 1987; Pommerenke and Weed, 1991).

The fluid dynamics metaphor also has implications for medical research. Medical understanding of the cardiovascular system is so entrenched in this metaphor that we are not even aware that it *is* a metaphor; certainly this constrains the nature of the ideas generated.

The metaphor also affects the direction research will take in the future. For example, Dr. Thomas Ryan was quoted in the *The New York Times* as saying, "I think the Holy Grail is the formulation of a medicine that one can take in pill form that will act as a cardiovascular Drano and clean out the pipes" (Ryan, 1984). This is indeed the direction we can expect medicine to take as long as it depends on metaphors like THE BODY AS A MACHINE and MEDICINE IS A REPAIR BUSINESS. If society wants medicine to lower

health costs by emphasizing health promotion, then the unconscious metaphors must at least be made conscious, perhaps even superseded by new, more appropriate metaphors.

A new metaphor

What might be the effects of a different metaphor on the medical system? Rather than a metaphor which depends on the BODY IS A MACHINE and MEDICINE IS A REPAIR BUSINESS metaphors, let us imagine a metaphor grounded in nurturing. Such a metaphor should foster a greater sense of connection to our body in general and to the cardiovascular system in particular. In this light, I propose the metaphor THE CARDIOVASCULAR SYSTEM IS A PET TO BE TAKEN CARE OF, with the following mappings:

Source Domain		Target Domain
OWNER'S RESPONSIBILITY FOR PET	---------->	INDIVIDUAL'S RESPONSIBILITY FOR HEALTH
PET'S NEEDS FOR PROPER DIET, REGULAR EXERCISE, AND LOVING, ATTENTION	---------->	CARDIOVASCULAR NEEDS FOR LOW FAT DIET, REGULAR EXERCISE, AND LOVING ATTENTION
PET'S RESPONSE TO GOOD TREATMENT IS LONGER LIFE AND BETTER RELATIONSHIP TO OWNER	--------->	HEART AND BLOOD RESPONSE TO HEALTHY LIFESTYLE IS LONGER LIFE AND BETTER RELATIONSHIP TO INDIVIDUAL

This metaphor would highlight features of the cardiovascular system which are important in a medical practice oriented towards prevention rather than

repair and replacement.

First, by mapping the cardiovascular system as a pet to be taken care of, this metaphor accounts for a key feature of the cardiovascular system which by definition is left out of any machine metaphor: the heart and vasculature comprise a living system. As a living system, we would expect the cardiovascular system to be damaged easily, but still capable of healing if given time and the appropriate nutrients, rest, etc. This kind of knowledge is vital in prevention strategies like smoking-cessation; people need to believe that damage from cigarettes is reversible or else they have no motivation to quit.

Second, the pet metaphor entails an understanding of the cardiovascular system as personally connected to the individual and as responsive to loving care. Seeing the cardiovascular system as responsive is a particularly empowering entailment of this metaphor, offering encouragement that an individual's health might really respond to lifestyle changes. The sense of personal connection is also essential to motivating lifestyle changes.

Both these entailments are in sharp contrast to the entailments of a machine metaphor. Machines are designed *not* to respond to external changes or stresses; the goal is for a machine to continue functioning at a pre-determined level or pattern of levels for as long as possible. In a machine metaphor, for example, stress reduction becomes an appropriate goal for cardiovascular disease "prevention." In contrast, THE CARDIOVASCULAR SYSTEM IS A PET TO BE CARED FOR metaphor includes change and stress as normal parts of having a pet; the goal is to learn how best to respond to those feelings.

WAR METAPHORS IN MEDICINE

OVERVIEW

In the late 19th century, after the development of the light microscope and with the identification of microorganisms as the cause of many diseases, the practice of Western medicine changed dramatically. The humors and imbalances which Hippocrates, Galen, and Celsius described were no longer thought to be the source of human illness, and language changed accordingly. A new area of medical science opened up, immunology, and a new medical metaphor came into play which described the interactions of these infectious diseases with the human body: IMMUNOLOGY IS WAR. Clearly, the metaphor originated in human experience, not in immunological research on electron micrographs, radio-immunoassays, and Ouchterlony double diffusion gels. As I shall demonstrate, this metaphor is consistent with one which had existed for hundreds of years before in common language: HUMAN INTERACTION WITH DISEASE IS WAR. The war metaphor for disease has been around for centuries, originating long before the discovery of a microscope, let alone of B cells, neutrophils, and macrophages.

The same source domain, war, was also mapped onto another target domain: medical microbiology. While immunology looks at the interaction between infectious organism and human body, focusing primarily on the body's responses to infection, medical microbiology pays more attention to the infectious organisms themselves. Virtually ignoring the human host, it is the branch of medical science which investigates the nature of bacteria, viruses,

and parasites — their life cycles, natural habitats, reproductive techniques, etc. — with the ultimate goal of assessing and taking advantage of their strengths and weaknesses. This relationship between the medical microbiologist and the microorganisms also came to be seen as an armed conflict, MEDICAL MICROBIOLOGY IS WAR.

Finally, medicine as a whole came to adopt a war metaphor. Paul de Kruif has written that Louis Pasteur in his later years "tried to turn all doctors into microbe hunters" (de Kruif, 1926; p. 55), as he learned the importance of microorganisms in human disease. Modern American medicine has done what Pasteur could not do and more; most, if not all, of today's doctors see themselves as warriors against disease, illness, and death. As I hope to demonstrate, the dominant metaphor in medicine today is MEDICINE IS WAR; medicine has adopted the warlike metaphor of microbiology, and its lack of attention to the human experience as well.

The result has been the gradual disappearance of the patient, from language and from primacy. The IMMUNOLOGY IS WAR metaphor includes the sick person in the battle, but the MEDICAL MICROBIOLOGY IS WAR metaphor does not. While not problematic for microbiology, this war metaphor came to be mapped, inappropriately, onto the work of practicing physicians - not medical scientists, but doctors with their own individual sick patients. In that mapping, the patient essentially disappeared.

I intend to demonstrate the evidence for all three conceptual metaphors, first IMMUNOLOGY IS WAR, then MEDICAL MICROBIOLOGY IS WAR, and lastly MEDICINE IS WAR. I will consider when these metaphors are useful,

and when they break down. Finally, I will also suggest some alternatives to an understanding of medicine as an armed conflict.

PART I: The HUMAN INTERACTION WITH DISEASE IS WAR metaphor

> ...the noble city of Florence, which for its great beauty excels all others in Italy, was visited by the deadly pestilence...It unhappily spread westward, growing in strength as it swept relentlessly on from one place to the next. In the face of its onrush, all the wisdom and ingenuity of man were unavailing"
> (Boccaccio, 1355; p.50)

In this passage from Bocaccio's *The Decameron*, the plague is seen as a conquering army falling upon the city, and the citizens as weaponless defenders, whose stratagems get them nowhere. Given the almost universal experience of death and destruction caused by infectious diseases throughout history — damage many times greater than that due to all wars ever fought — a metaphor of violent conflict for the human experience of disease is unsurprising.

For example, three pandemics of human bubonic plague have taken place in our history: one in the 6th century; a second one from the 14th century to the 17th century; and the third in China in the 1860s. In 1348 and years after, the Black Death produced an unparalleled drop in the estimated population of Europe, making such a dent that not until the early 16th century was the population of 1300 again attained. In today's United States, the only epidemic disease which can significantly alter national mortality rates is influenza, which can produce a spike in mortality graphs in less than one month. The influenza virus has 4-5 different genetic expressions of surface sites, which can undergo variation and thus avoid the human body's immune response. Epidemics of influenza have been reported since the 1500s; the Great Pandemic of 1918 killed 43,000 in the US Army, more than 500,000 in the US

itself, and more 20 million worldwide. (Swartzberg, 1989)

> Infectious disease is one of the great tragedies of living things — the struggle for existence between different forms of life. Man sees it from his own prejudiced point of view; but clams, oysters, insects, fish, flowers, tobacco, potatoes, tomatoes, fruit, shrubs, trees, have their own varieties of smallpox, measles, cancer, or tuberculosis. Incessantly, the pitiless war goes on, without quarter or armistice — a nationalism of species against species.
> (Zinsser, 1934; p. 7)

Many historical and literary passages from Western civilization demonstrate a conceptualization of human interaction with disease through this war metaphor. The mapping of the metaphor is as follows:

Source Domain		Target Domain
WAR	---------->	INTERACTION OF HUMAN AND DISEASE

In these passages, outbreaks of disease are often referred to as "visitations", and are clearly understood as visits from violent, unwanted invaders from other lands or even from God. Influenza, for example, was first known in Italy as the "malatia influenza per le stelle," the cursed influenza from the stars. The implication is that disease comes from somewhere else, not from the defender's territory, but from a foreign land.

Source Domain		Target Domain
INVADER	---------->	DISEASE
DEFENDERS	---------->	HUMANS

In the introduction to *The Decameron*, Boccaccio describes the origins of the plague: "But whatever its cause, it had originated some years earlier in the East, where it had claimed countless lives before it unhappily spread westward..." (Boccaccio, 1355; p.50). This origin from elsewhere is an

important feature of this metaphor; disease is conceptualized as "the other," a foreign invader.

While Boccaccio is convinced that the plague did not start in Italy, other authors from other countries are equally sure that the plague is foreign to them, perhaps originating in Boccaccio's homeland:

> It was about the beginning of September, 1664 that I, among the rest of my neighbours, heard in ordinary discourse, that the plague was return'd again in Holland; for it had been very violent there, and particularly at Amsterdam and Roterdam, in the year 1663, whither they say, it was brought, some said from Italy, others from the Levant, among some Goods which were brought home by their Turkey fleet; others said it was brought from Candia; others from Cyprus. It mattered not, from whence it came; but all agreed it was come into Holland again.
>
> (Defoe, 1722; p. 23)

Syphilis also was understood to come from somewhere else. Fracastoro points out that in his youth it was called the Spanish Pox, but that now blame is assigned to the French, via the Italians:

> I sing of the terrible disease, unknown to past centuries, which attacked Europe all in one day, and spread itself over a part of Africa and Asia. I will explain what combination of events have caused it, how it arose in Italy, at the time that the French armies rendered desolate that unhappy country, which caused it to be called the French Disease.
>
> (Fracastoro, 1531; cited in Swartzberg, 1989)

Society and disease

This Western conceptualization of disease as a foreign invader could apply either to individuals fighting disease or to an entire society fighting disease. In either case, the ill humans were the protagonists, the main combatants against disease. Before the germ theory, when a society was the combatant, the

war metaphor became very concrete; the conceptualization of disease as an invader was taken so literally that the precautions against disease were almost identical to those taken against a human invader. For example, consider the following description of Paris in 1831, written by a French surgeon and inspector of the army health service, Dominique Larrey:

> The topographical situation of France is so advantageous that there is little to fear in this country from cholera morbus or any other pestilential epidemic.
>
> ...As for the plague's entering by way of our seaports, I find little probability of such an occurrence, particularly in the Atlantic ports, where sanitary measures have been so carefuly observed that it would seem to me quite difficult for the disease to infiltrate our borders. And in any event, the disease would quickly be confined to the ports and treated with such success by rational medicine, known to all French physicians, that there need be no fear of its spreading to the interior....
>
> Throughout France, the felicitous application that has been made since the Revolution of 1789 of rules of hygiene and health measures has redounded to the benefit of the country's inhabitants....All things considered, then, we may feel perfectly secure as to the danger of the invasion and spread of cholera morbus in France.
>
> By contrast, recall that, so far as we know, the disease has proved devastating only in fetid marshy areas in certain parts of Asia Minor, Russia, and Poland...
>
> (Larrey, 1831; cited in Delaporte, 1986; p. 1)

Larrey wrote this just before the onset of the 1832 cholera epidemic in Paris. He reflects traditional Hippocratic theories, in which climate and topography were understood to be barriers to invasion of disease, just as they were barriers to actual invasion by warring neighbors.

> In 1831 Larrey believed that cholera would not invade France. The reasons for his belief were clearly stated; they had to do with geography, geopolitics, and history.
>
> (Delaporte, 1986; p. 8)

In other words, Larrey conceptualizes cholera almost exactly like a hostile foreign country; replace "cholera" with the name of another European country, and the passage reads like an analysis of a potential war.

Lewis Thomas describes a more modern incident of fear of a new foreign invasion in a Western society, the United States of America:

> We were all reassured, when the first moon landing was ready to be made, that the greatest precautions would be taken to protect the life of the earth, especially human life, against infection by whatever there might be alive on the moon. And, in fact, the elaborate ceremony of lunar asepsis was performed after each of the early landings...The idea that germs are all around us, trying to get at us, to devour and destroy us, is so firmly rooted in modern consciousness that it made sense to think that strange germs, from the moon, would be even scarier and harder to handle.
>
> (Thomas, 1979; p. 99)

The individual and disease

In early Western civilization, the majority of illnesses were epidemics. Cholera, typhus, the plague - all of these struck down large numbers of individuals in a seemingly random fashion. Individuals felt powerless against diseases such as these. In conceptualizations of our own illness, each of us sees ourself as the protagonist in the war against disease; yet an individual's options in a large-scale war are limited. Like an individual soldier in a war, the ill person must hope that someone is in charge, that someone is leading all the individuals together towards a defeat of disease. The individual can only strengthen bodily defenses in the way current medical thought suggests and hope for the best.

Medical recommendations to the citizens even matched army regulations.

"Doctors, consulted about what diet was best for warding off the disease, had warned against drinking alcoholic beverages, especially to excess" (Delaporte, 1986; p. 67). Propaganda attempts to control the minds of individual soldiers during war so they will be better able to fight; similarly, Delaporte notes: "Violent emotions due to tumult and disorder were held to favor the spread of the epidemic" (Delaporte, 1986; p. 69). According to the *Gazette Médicale de Paris*, a large riot at an important general's funeral was implicated in the spread of cholera:

> As for the new cholera victims, it is correct to attribute their increased number to the political disaster that we suffered a few days ago. Many of those who became ill were people upset by violent emotions who succumbed to the epidemic influence. Without this unforeseen shock it is probable that a certain number would have escaped, and that those who lacked the strength to resist would not have been stricken so suddenly.
> (A.-N. Gendrin, 1832; cited in Delaporte, 1986; p. 69)

If the individual is the protagonist in the war against disease, the individual's body becomes the primary defense. This is the metaphor which motivates John Donne's descriptions of "illness as an enemy that invades, that lays siege to the body fortress" in his *Devotions upon Emergent Occasions*. In his first meditation, Donne writes of the individual's attempts to strengthen the body against the onslaught of disease:

> Variable, and therefore miserable condition of Man; this minute I was well, and am ill, this minute. I am surpriz'd with a sodzine change, and alteration to worse, and can impute it to no cause, nor call it by any name. We study *Health*, and we deliberate upon our *meats*, and *drink*, and *ayre*, and *exercises*, and we hew, and wee polish every stone, that goes to that building; and so our *Health* is a long and a regular work; But in a minute a canon batters all, overthrowes all, demolishes all; a *Sicknes* unprevented for all our diligence, unsuspected for all our curiositie; nay, undeserved, if we consider only *disorder*,

summons us, seizes us, possesses us, destroyes us in an instant..
(John Donne, 1624; p. 1, lines 5-11)

Donne points out the powerlessness of the individual in the fight against disease; for all the siege preparations, sickness can suddenly invade.

Medicine and disease

In either struggle, the individual or society against disease, the role of medicine and of the doctor is merely one of ally, not primary combatant. Medicine must provide information and encouragement, with which individuals and society can arm themselves, but the heroes are still the individuals and the society fighting the disease directly.

Consider the following account of the 1832 cholera epidemic by Michel Chevalier, a French economist. He wrote the account when the cholera epidemic was full-blown, a few months after Larrey's description above.

> Should poisoning, pestilence, and death be the watchwords of the government of France, the world's premier nation?
>
> ...The admirable people of Paris, who are so heroically confronting the cholera of poverty, which in eighteen months has tripled the death rolls—the people of Paris were not made to serve as fodder for the cholera of Asia and to die like slaves in pain and terror.
>
> There is one true protection against cholera; it is to remain, in the presence of this new and ubiquitous enemy, courageous and invincible.
>
> (Chevalier, 1832; cited in Delaporte, 1986; p. 2)

Chevalier casts the people of Paris as the heroes in this battle; he reminds them that they "were not made" to die as cannon fodder and exhorts them to remain courageous. In the same bulletin, however, he goes on to admit that

the battle is not going well, and makes his first mention of medicine:

> Instead, Paris has succumbed to this new invasion; the disease has proved more lethal here than elsewhere, and no quarter of this great city is nowadays so populous as its cemeteries.
>
> What good, then, are all its hospitals, its doctors, its science, and its public administration? Are all the resources of civilization worthless?
>
> (Chevalier, 1832; cited in Delaporte, 1986; p. 3)

This description of medicine is one of an ally which has let down its side; medicine may have failed, yet the battle goes on. In Larrey's description, medicine's role is also one of ally; he describes this role as keeping the disease confined to the ports and preventing its spread.

As allies, rather than primary combatants, medicine can also be turned to the other side, to the side of disease. For example, during the great cholera epidemic in Paris, doctors were thought to be the agents of the bourgeoisie, who themselves were perceived to be enemies of the people.

> Rather than make the hackneyed claim that in time of epidemic class hatreds are exacerbated, we must try to understand how violent attacks on physicians resulted from the widespread belief that the government was seeking to resolve the issue of unemployment by poisoning the unemployed. Medical personnel were simply viewed as the agents of the enemy.
>
> (Delaporte, 1986; p. 8)

In the Paris cholera epidemic, when doctors were not being accused of serving as enemies of the people, they were viewed as paper-pushers and do-nothings:

> The government prepared its cholera tables, which as everyone knows are remarkably accurate; and during the epidemic its agents did nothing else.
>
> (F.-P. Emangard, 1832; cited in Delaporte, 1986; p. 72)

This view of doctors as allies at best, powerless, or agents of the enemy at worst, was fairly typical of the public's impression of the medical profession until the time of the germ theory. As we shall see, with the discovery of the role of microbes in human disease, medicine became more powerful and metaphors changed accordingly.

Part II: The IMMUNOLOGY IS MODERN WARFARE metaphor

The body's interaction with infection is still understood in terms of military interaction, even by medical science:

> We live in a potentially hostile world filled with a bewildering array of infectious agents of diverse shape, size, composition and subversive character which would very happily use us as rich sanctuaries for propagating their 'selfish genes' had we not also developed a series of defence mechanisms at least their equal in effectiveness and ingenuity (except in the case of many parasitic infections where the situation is best described as an uneasy and often unsatisfactory truce).
>
> (Roitt, 1988; p.1)

This poetic passage is not the work of a novelist, describing a character's phobia of infection, but rather the first paragraph in one of the classic medical textbooks, Ivan Roitt's *Essential Immunology*. Immunology is the study of the immune system and its interactions with the microbiological world of parasites, viruses, and bacteria. The word immunology is rooted in Latin, *immunitas*, meaning "freedom from"; according to our biomedical understanding, the immune system keeps the body free from infection and disease. The passage quoted is one of a plethora of examples in immunology which demonstrate that this biomedical understanding rests on a conceptual metaphor, IMMUNOLOGY IS MODERN WARFARE.

In the above selection, the author creates a dichotomy of conflict: us against the world, humankind against the subversive agents of disease, our immunological defences against their attacks. At worst, our relationship with microorganisms is understood to be one of declared war and open hostilities,

at best, an uneasy truce. The IMMUNOLOGY IS MODERN WARFARE metaphor is a natural progression from the "us against them" dichotomy common to the general public's conceptualization of disease; the self/foreign distinction of immunology is completely coherent with the defender/invader dichotomy. Thus we have the following mappings:

Source Domain	Target Domain
WAR ---------->	IMMUNOLOGY
THE COMBATANTS ---------->	MICROORGANISMS AND THE HUMAN IMMUNE SYSTEM

Since the majority of immunological research is done on mice and other non-human subjects, most immunologists would probably understand the combatants to be microorganisms against the immune systems of any living, non-microbiological organisms, not just against the immune systems of humans. However, for purposes of simplicity, and because the ultimate goal of the research is in fact to use acquired information to "defend" humans, I will consider the combatants as stated above.

Basic mappings

In a war, the defenders typically protect a particular territory and its civilian population, and the attackers attempt to take over that territory for their own use and the use of their civilians. Each combatant thus represents an opposing side which the combatants protect at the risk of their own lives. Accordingly, in the IMMUNOLOGY IS MODERN WARFARE metaphor, the immune system is understood to protect the territory of the human body and its non-combatant, civilian population, the helpless tissue and unarmed

parenchymal cells.

Source Domain		Target Domain
THE ATTACKERS	---------->	MICROORGANISMS (BACTERIA, PARASITES, FUNGI, VIRUSES, AND PRIONS)
TERRITORY ATTACKED	---------->	HUMAN TISSUE
THE DEFENDERS	---------->	HUMAN IMMUNE SYSTEM: CELLS, SUBSTANCES, AND PROCESSES
TERRITORY DEFENDED	---------->	HUMAN TISSUE AND HUMAN QUALITY OF LIFE

The last mapping is particularly important; the immune system is understood to protect not only our tissue, but our health and its effects on our quality of life. A specific example of this metaphor in action demonstrates these mappings:

> The meningococcus, viewed from a distance, seems to have the characteristics of an implacable, dangerous enemy of the whole human race. Epidemics sweep through military barracks, across schoolyards, sometimes over the populations of whole cities. The organism invades the bloodstream, then the meningeal space.
>
> (Thomas, 1979; p. 93)

The defenses

How can we understand how the immune system goes about defending the human body? It is divided into two functional parts, the innate immune system and the adaptive immune system. These parts are understood in immunological literature as two lines of defence:

> Innate immunity acts as a first line of defence against infectious agents and most potential pathogens are checked before they establish an overt infection. If these first defences are breached, the adaptive immune system is activated and produces a specific reaction to each infectious agent which normally eradicates that agent.
>
> (Roitt, Brostoff, and Male, 1989; p.1)

Each element of the human immune system is then understood as a specific resource utilized by the immune system in its defence of the body. "The major line of defence is of course the skin which, when intact, is impermeable to most infectious agents..." (Roitt, 1988; p. 2). Once the skin has been penetrated, specific immune responses come into play. These can also be divided into two types, the cell-mediated immune response and the humoral (soluble factors in the blood) response. The cells are considered the actual army itself, and the humoral defences are the weapons they can use.

The very names of the cells which do the fighting suggest a military parade: "Killer T-cells," "Natural Killer Cells," "Helper T-cells," and "Suppressor T-cells," to name a few. Each of these cells plays a unique, complex role in the military-immunological complex. For example, Helper T-cells release biologically active substances called interferons, which block viral replication and make surrounding cells resistant to viral spread: "...the net result is to establish a cordon of uninfectable cells around the site of virus infection so restraining its spread" (Roitt , 1988; p. 13).

If an invader does manage to penetrate the defended territory and infect a normal human cell, these virally infected cells of the body are purged by the FBI of the immune system, the Natural Killer (NK) cells. "The various

interferons augment NK cytotoxicity and since interferons are produced by virally infected cells, we have a nicely integrated feedback defence system" (Roitt, 1988; p. 13).

T-cells kill in one way, using biological substances to cause the invaders to self-destruct from the inside. Another group of cells kills more directly, and this sort of killing in the immune system has its own metaphor, KILLING IS EATING. The process of "phagocytosis," which literally means cellular eating, is the process by which certain invaders are killed. In phagocytosis, defending cells surround invading material and enclose it within a vacuole or phagosome inside their own cytoplasm: "The engulfment and digestion of micro-organisms is assigned to two major cell types," the polymorphonuclear neutrophil and the macrophage. The T-cells don't do the dirty job themselves, but the phagocytic cells are like Mafia hit-men, and are referred to as professional killers, "professional phagocytes" (Roitt, 1988; p. 2). These hit-men are highly efficient in their activity: "Trouble starts for the invader from the moment phagocytosis is initiated" (Roitt, 1988; p. 4). When the defence is going well, we have the following situation: "Events are moving smartly and within one minute the cytoplasmic granules fuse with the phagosome and discharge their contents around the imprisoned micro-organism which is subject to a formidable battery of microbicidal mechanisms""(Roitt, 1988; p. 4).

If the cellular immune response is the actual army of the immune system, then the humoral response can be considered the arsenal of that army. Soluble substances in the blood can damage invading microorganisms once they get through the first lines of defence; they include complement, acute

phase proteins, lysozyme, etc: "Humoral mechanisms provide a second defensive strategy" (Roitt, 1988; p. 11). Many of the names of these biologically active substances and the processes in which they are involved also resonate with the vocabulary of military strategies and weapons: "bystander lysis," "contrasuppression," "cell-dependent cytotoxicity," "dominant idiotypes," "chimeras," "interferon," "respiratory burst."

Critical features of immunology

What are some of the crucial elements of immunology accounted for by the metaphor? Three of the most important are:

1) complex interactions among multiple participants,
2) diversity of those participants, and
3) an all-important outcome, life or death.

Modern warfare has many players, from domestic surveillance to be sure no insurgency arises at home, to the army in the field. Each of these players has a different role, different strengths, and different weaknesses. Each is understood to sometimes act independently, sometimes in concert with other members of the defenders. Each of these characteristics is mapped onto the combatants in immunology and is consistent with their ontology. Pathogenic microorganisms are diverse, with different methods of entering the body, different ways of interacting with human tissue, and different susceptibilities to the human immune system. The immune system must be able to respond to all these different microorganisms differently; it is itself equally diverse:

> Our microbial adversaries have tremendous opportunities through mutation to evolve strategies which evade our innate

> immune defences...The body obviously needed to "devise" defence mechanisms which could be dovetailed individually to each of these organisms no matter how many there were. In other words *a very large number* of specific immune defences needed to be at the body's disposal. Quite a tall order.
> (Roitt, 1988; p. 15)

The outcome of a microorganism/ immune system interaction also has certain entailments. Unpredictable and amoral, infectious diseases may kill the doctor tending a sick person, leaving the patient well; they strike down a child as easily as her mother, a good citizen as easily as a criminal. Microorganisms have no code of ethics, no rules about methods or victims; neither does the immune system, which does it best to protect all its responsibilities equally in any way it can. These features must be mapped by any metaphor describing the interaction of these two agents; clearly, no sports or game metaphors would be as appropriate for immunology. Not only would such metaphors entail both sides playing by accepted rules, but they would map a relatively unimportant outcome of a recreational activity onto the outcome of a immune system/microorganism interaction, which is life or death.

An IMMUNOLOGY IS SINGLE COMBAT metaphor might work, but would still not account for the diversity, multiplicity, and complexity of interactions in immunology. Moreover, that metaphor would also entail a code of honor, again clashing with the ontology of immunology. Modern warfare, on the other hand, is a useful target domain as it is understood to be without rules ("All's fair in love and war"), as well as a complex interaction of many diverse participants.

An important entailment of IMMUNOLOGY IS MODERN WARFARE is that the assignment of attacker and defender in the mapping assigns identities of "good guys" and "bad guys," since many cultures, especially Americans since Pearl Harbor, tend to see right on the side of any party attacked without provocation and/or warning. (A recent example is of course the United States response to the invasion of Kuwait, which resulted in the classification of Saddam Hussein and Iraq as "bad" and Kuwait and Saudi Arabia, potentially the next victim, as "good.")

Bad guys are typically presented in Western cultures as the aggressors, a motley bunch; arguing amongst themselves, they have no coordination, no leader, and use methods of brute force. Good guys, on the other hand, are often the underdog; heavily outnumbered, they succeed by working together. Both sides have the potential to get access to high quality weapons, the latest in technology. Thus:

Source Domain		Target Domain
THE GOOD GUYS	---------->	HUMAN IMMUNE SYSTEM
COORDINATED ACTION	----->	PARTS OF THE SYSTEM ACT TOGETHER
WEAPON TECHNOLOGY	----->	NATURALLY-SELECTED BIOCHEMICAL ADAPTATIONS
THE BAD GUYS	---------->	MICROORGANISMS
WORK SEPARATELY	-------->	ACT INDEPENDENTLY
WEAPON TECHNOLOGY	---->	NATURALLY-SELECTED BIOCHEMICAL ADAPTATIONS

The microorganisms are the bad guys, none of them acting together efficiently, but all attempting to take over human territory. The good guys, the human immune system, are doing their best to defend themselves against the ferocious onslaught. Again, this makes sense given the ontology of microorganisms, which do not in fact act together except by accident, and the immune system, which has a more highly organized and unified defence. Lastly, humans are frightened of and resent infectious disease, for the reasons described above, its amorality and unpredictability; assigning good guys and bad guys also fits the generic, human dislike of the bad guys to our feelings about agents of disease.

Mapping new features of immunology

In early understanding of disease and its interaction with humans, the battle and the metaphor are somewhat one-sided. No one in Boccaccio's time, for example, knew anything about the complex defences in the human body that kept some people alive despite exposure to *Yersinia pestis*; accordingly, the metaphor was much more detailed about the weaponry on the side of the disease, and fairly skimpy on the side of the body. Today's immunology is another story, and the flexible war metaphor has proven capable of swelling to embrace the vast amount of new knowledge accumulated in the last few decades, with no gaping holes or inconsistencies created. It is still able to fit conceptualizations on the cutting edge of immunological research.

For example, current immunological research has examined many details of how the army agents and their weapons operate:

> How does the killer T-cell know when it has reached its target? It has to recognize two features before striking: one is the presence of viral antigen and the other is its location on the surface of a body cell; it does not want to dissipate its efforts on extracellular free virus.
>
> (Roitt, 1988; p. 121)

Research has also recently determined the origins of this army of cells and its humoral weaponry. The ranks of this army are apparently swelled by a military draft and trained in immunologic warfare: "There is general agreement that a non-specific T-acceptor cell is finally recruited and is triggered by antigen to release non-specific suppressor factors..." (Roitt, 1988; p. 119).

Textbook descriptions of immunological processes are even beginning to have that Vietnam War circumlocutionary quality to them, in which direct statements about death and destruction are disallowed: "...humoral antibodies can combine with antigens such as bacterial toxins and cause neutralization of the toxin..." (Robbins, 1984; p.158)

A recently discovered phenomenon is the existence of auto-immune diseases. Auto-immune damage causes some of the most debilitating and severe pathology in medicine, from rheumatoid arthrtis to systemic lupus erythematosus (SLE), myasthenia gravis to Hashimoto's disease. In these diseases, the immune system attacks itself: "Indeed, a host of disorders affecting all organ systems are clearly attributable to...the abnormal emergence of immunity against one's own tissues and cells" (Robbins, 1984; p. 158).

Even this can theoretically be accounted for by a special case of IMMUNOLOGY IS MODERN WARFARE. Auto-immunity can be understood as pitting members of the same side against each other, defender against defender. I propose that this concept is not incompatible with a modern view of warfare. The majority of damage is usually presumed to be due to direct interaction with the other side; however, many Americans are familiar with incidents of "friendly fire," when Americans fired upon themselves. These incidents were quite common in World War II, most notably during Operation Cobra in France. The infamous self-mutilations and killing of officers by American troops in Vietnam also provide unpleasant examples of this reality of war. In this understanding of the military, defences battling defences are not unlikely.

Source Domain		Target Domain
FRIENDLY FIRE	---------->	AUTOIMMUNE DISEASE
COMBATANTS	---------->	DIFFERENT ELEMENTS OF THE HUMAN IMMUNE SYSTEM AGAINST SELVES
DESTRUCTION OF THE TERRITORY BELONGING TO THE DEFENDERS	---------->	DESTRUCTION OF THE HUMAN BODY

The friendly fire metaphor for auto-immunity would seem to be a very helpful construct, and might be useful in teaching, but most immunological textbooks do not appear to understand it in precisely this way. They do, however, understand auto-immunity through an entailment of the IMMUNOLOGY IS MODERN WARFARE metaphor. Once humans discovered the existence of microorganisms, the historic "us against them"

dichotomy became more precise; instead of disease in general against humanity, the dichotomy pits microorganisms against the human immune system, invader against defender. In immunology, a vital entailment of this "us vs. them" dichotomy is that "them" is understood as foreign, "the other," while "us" is understood as self.

> The individual must also recognize what is foreign, i.e. what is "non-self." The failure to discriminate between "self" and "non-self" could lead to the synthesis of antibodies directed against components of the subject's own body (autoantibodies) which in principle could prove to be highly embarrassing.
> (Robbins, 1984; p. 158)

This description of auto-immune disease is thus very like a description of friendly fire, a failure to discriminate between the self and the foreign invader.

Problems with the metaphor

IMMUNOLOGY IS WAR is a powerful and flexible metaphor, conveying a great deal of information about the abstract subject of immunology in a compelling and easily understood way, and capable of stretching to fit most of our new understanding about immunology. One of the few major inconsistencies is that many infections are actually beneficial, not destructive:

> A totally different mechanism is that of microbial antagonism associated with the normal bacterial flora of the body. These suppress the growth of many potentially pathogenic bacteria and fungi at superficial sites by competition for essential nutrients or by production of inhibitory substances such as colicins or acid. To give one example, pathogen invasion is limited by lactic acid produced by particular species of commensal bacteria which metabolize glycogen secreted by the vaginal epithelium. When protective commensals are disturbed by antibiotics, susceptibility to opportunistic infections by *Candida* and *Clostridium difficile* is increased. (Roitt, 1988; p. 2)

Animals raised in environments free from microorganisms typically develop gross physiological and anatomical abnormalities, as the normal human body is colonized by a large number of microorganisms. The absence of these bacteria actually causes problems. Indispensable microbes are found in the human and other mammalian (cattle, horses) intestinal tracts, supplying essential nutrients and offering enzymes for the breakdown of otherwise indigestible food. Bacteria are necessary for the very existence of many insects which belong to our food chain (such as termites); bacterial symbionts collaborate with legumes in the fixation of nitrogen. War may sometimes may be beneficial to a small part of the population, for example economically for the weapons-makers, but the absence of war is seldom considered a problem. This is a war that must never be won; clearly this feature of immunology cannot be understood by IMMUNOLOGY IS MODERN WARFARE.

Another problem with this metaphor relates to the "us vs. them" dichotomy described earlier, which creates a schism between microorganisms and man. Although this dichotomy fits much of our current and historical understanding of infectious disease and the interaction of the human immune system with microorganisms, this dichotomy also limits our understanding. This schism is clearly described by Lewis Thomas in *The Medusa and the Snail*:

> Watching television, you'd think we lived at bay, in total jeopardy, surrounded on all sides by human-seeking germs, shielded against infection and death only by a chemical technology that enables us to keep killing them off. We are instructed to spray disinfectants everywhere...We apply potent antibiotics to minor scratches and seal them with plastic...We

> live in a world where the microbes are always trying to get at us, to tear us cell from cell, and we only stay alive through diligence and fear. (Thomas, 1979; p. 90)

In his *Lives of a Cell*, he points out some of the inaccuracies in this world view and provides an alternative metaphor, microbes as a business:

> It is true, of course, that germs are all around us; they comprise a fair proportion of the sheer bulk of the soil, and they abound in the air. But it is certainly not true that they are our natural enemies...The commonest of encounters between bacteria and the higher forms of life take place after the death of the latter, in the course of recycling the elements of life. This is obviously the main business of the microbial world in general, and it has nothing to do with disease.
> (Thomas, 1974; p. 99)

This "us vs. them" dichotomy puts the blame of damage on the invader and does not assign any blame to the defender. However, the violence of many diseases, for example leprosy and syphilis, is due primarily to the reaction of the host's own immunological "defences" to the invading organism, rather than due to any direct effect of that organism itself:

> The immune response is an exquisitely specific yet highly versatile two-edged sword. Although it is vital for survival in the often hostile microbiologic environment, an immune reaction may cause fatal disease, as to the sting of a bee.
> (Robbins, 1984; p.160)

A specific example of the dangers of the immune system itself is provided by Lewis Thomas:

> At first glance, [choriomeningitis in mice] seems to represent invasion of, and damage to, the central nervous system by a virus specifically adapted for such behavior. In actual fact, however, the disease is caused by invasion of the brain surface by the host's own lymphocytes, rather than by any neurotoxic property of the virus...The disease is, essentially, the result of the host's response to the virus.
> (Thomas,1979; p. 94)

The dangers of maintaining weapons and armies are beginning to be accounted for by the commonly understood source domain of war. For example, many people do in fact feel that the atomic bomb creates more problems in national defence and international relations than it solves. In this interpretation of war, the metaphor IMMUNOLOGY IS MODERN WARFARE actually remains valid, but this interpretation is not typical of medicine. Fritjof Capra states the situation best:

> The point is that the development of infectious diseases depends as much on the response of the host as on the specific characteristics of the bacteria...There seem to be very few infectious diseases in which the bacteria cause actual direct damage to the cells or tissues of the host organism. There are some, but in most cases the damage is caused by an overreaction of the organism, a kind of panic in which a number of powerful, unrelated defense mechanisms are all turned on at once. Infectious diseases, then, arise most of the time from a lack of coordination within the organism, rather than from injury caused by invading bacteria.
>
> (Capra, 1982; p. 154)

The IMMUNOLOGY IS MODERN WARFARE metaphor places the emphasis on what weapons the human defenders *as a group* have to fight the invaders, the generalized genetic capabilities of humans as a species to counteract disease. Little research in America goes into the individual differences that cause some people exposed to a disease to show symptoms, while others seem unaffected. Intriguingly, French medicine has historically had a great deal of interest in these more unpredictable elements of the immune reaction. The French even have a a special word to describe it, *terrain*:

> There is no really good translation for *terrain* in English. The old-fashioned word "constitution," which has largely gone out

> of favor in America, probably translates it best. "Risk factors" can describe aspects of the *terrain* but connotes particular aspects, whereas *terrain* is a more all-encompassing concept. "Resistance" used in a general sense is also close to the meaning, but "resistance" is usually used in the specific sense of resistance to a specific disease, and that is not at all what *terrain* means. Many diseases result from a combination of some type of outside insult and the body's reaction to that insult. While English and American doctors tend to focus on the insult, the French and Germans focus on the reaction and are more likely to try to find ways to modify the reaction as well as fight off the insult.
>
> (Payer, 1988; p. 61)

A different priority in medical research emerges from the concept of *terrain*, as opposed to the priority created by the simplistic good guys/bad guys scenario, the current biomedical model. Medical research suggested by that reading of the metaphor is directed at finding specific bugs and developing medicines and technology for killing them. This research has been fruitful until recently; now, however, we we are finding more and more resistance by the microorganisms to our drugs. The faster the drugs change, the faster the bugs change. The most common bacteria long ago became resistant to penicillin, and other important drugs are also beginning to lose their efficacy. Moreover, all these drugs are not without their own, often debilitating side effects: heart arrhythmias, impotence, and hyper-cholesterolemia, to name a few.

The few treatments, splenectomy, radiotherapy, and chemotherapy, which *are* addressed toward the immune system's involvement in the disease simply suppress the immune defences completely. This leaves the organism susceptible to other infections which would be harmless in a non-medicated person; many cancer patients die of simple respiratory tract infections secondary to their treatment, not of the cancer itself. As drugs must become

more powerful, a point of disequilibrium is reached, in which the cure is worse than the illness. "Diseases desperate grown/ By desperate appliances are relieved/ Not at all" (Shakespeare, 1733; p. 1005).

A more modern reading of IMMUNOLOGY IS MODERN WARFARE must accepts the interactions of *both* microorganism and immune system, attacker and defender, in causing damage, as well as to consider the *terrain*. The next step would clearly be to study the complex interactions of mind, body, and environment that affect resistance to bacteria, to study the *ecology* of immunology.

PART III: The MEDICAL MICROBIOLOGY IS WAR metaphor

Medical science in the late nineteenth and early twentieth centuries became the guiding light of medicine, and Americans adopted the stars of medical science as a new set of heroes. In his 1924 novel *Arrowsmith*, Sinclair Lewis, working with the assistance of microbiologst Paul de Kruif, became the first novelist to describe one of these new heroes. Martin Arrowsmith is not the practicing family doctor of earlier novels like Somerset Maugham's *Of Human Bondage*. Instead of fighting to maintain humanitarian ideals in the face of economic conflicts, he is a medical microbiologist fighting for a different set of ideals, the purity of science. "Martin Arrowsmith was a new hero, scientific idealism a new subject, and scientific individualism a new (and rather unscientific) perspective" (Schorer, 1961; p. 438).

Paul de Kruif himself further popularized medical microbiologists in his books *Microbe Hunters* and *Men Against Death*, which tell the stories of famous medical researchers like Jacques Loeb, Robert Koch, Ronald Ross, Eli Metchnikoff, Paul Ehrlich, and of course Louis Pasteur. According to literary critic Mark Schorer, these "men of science," upon whom Arrowsmith's character was based, "were truly 'miracle men,' and their work was profoundly involved with the national destiny" (Schorer, p. 437, 1961).

> For Arrowsmith was another instant success...If, here and there, some doctors muttered in their beards (Joseph Collins, for example) that the novel was only a "cariacture" of certain features of the medical profession, their murmurs of dissent were lost in the shouts of praise...Sinclair Lewis had recognized at last the best as well as the worst in the American experience, and he was the most American of American novelists.
>
> (Schorer, 1961; p. 438)

Something about medical microbiologists appealed to the American psyche in the early 1900s, when Lewis wrote Arrowsmith, and has continued to appeal to the American public in general and to American medicine in particular. Medical microbiology, which investigates micro-organisms which cause disease, is still among the most glamorous areas within medical research.

The glamorous adventure

Hans Zinsser describes why microbiology became glamorous in *Rats, Lice, and History*:

> As a matter of fact, men go into this branch of work from a number of motives, the last of which is a self-conscious desire to do good. The point is that it remains one of the few sporting propositions left for individuals who feel the need of a certain amount of excitement. Infectious disease is one of the few genuine adventures left in the world. The dragons are all dead, and the lance grows rusty in the chimney corner...
>
> (Zinsser, 1934; p 13)

Medical microbiology started out as a glamorous adventure, a chivalrous pursuit for nineteenth century knights. Describing Paul Ehrlich, developer of the first "magic bullet," the cure for syphilis, de Kruif says:

> He hated classical training, he called himself a modern, but he had a fine knowledge of Latin, and with this Latin he used to coin his battle cries.
>
> (de Kruif, 1926; p. 309)

De Kruif points out the contrast between the medicine practiced by the old kind of doctor and medicine which the new kind of doctor, the medical microbiologist, hoped to practice:

> [Ehrlich] had the energy of a dynamo; he had believed you could treat sick people and hunt microbes at the same time; he had

> been head physician in a fmous clinic in Berlin, but he was a very raw-nerved man and was fidgety under the cries of sufferers past helping and the deaths of patients who could not be cured. To cure them! Not by guess or by the bedside manner or by the laying on of hands or by waiting for Nature to do it—but how to cure them! These thoughts made him a bad doctor, because doctors should be sympathetic but not desperate about ills over which they are powerless.
>
> (De Kruif, 1926; p.310)

Medical microbiology retains some of this glamour today, probably because of its success, which has been as great as Ehrlich and the other microbe hunters hoped. While only one infectious disease (smallpox) has been eradicated worldwide, several have been eradicated in the developed nations (rabies in Great Britain, for example) and most can be dealt with pharmacologically. In order to understand fully this glamorous adventure, however, we have to understand this relationship between the medical microbiologist and the microorganisms. As Hans Zinsser wrote in 1934,

> But however secure and well-regulated civilized life may become, bacteria, Protozoa, viruses, infected fleas, lice, ticks, mosquitoes, and bedbugs will always lurk in the shadows ready to pounce when neglect, poverty, famine or war lets down the defenses...About the only genuine sporting proposition that remains unimpaired by the relentless domestication of a once free-living human species is the war against these ferocious little fellow creatures, which lurk in the dark corners and stalk us in the bodies of rats, mice, and all kinds of domestic animals; which fly and crawl with the insects, and waylay us in our food and drink and even in our love.
>
> (Zinsser, 1934; p. 14)

Mappings

This branch of medical science seems to see its activities as modern Crusades against the heathen microorganisms. I believe that the essential metaphor reflected here is that MEDICAL MICROBIOLOGY IS KNIGHTLY WAR. The

target domain, medical microbiology, is understood in terms of the source domain, knightly war, with the following sub-mappings:

SOURCE DOMAIN		TARGET DOMAIN
KNIGHTLY WAR	---------->	MEDICAL MICROBIOLOGY
THE KNIGHTS	---------->	MICROBIOLOGISTS
THE ENEMY	---------->	A PARTICULAR MICROORGANISM

Zinsser's comments suggest that people go into this field for the glory of it, to pick up the rusty lance in the corner and pursue the dragon. Those were the "days of the roaring eighteen-eighties when men were ready to risk dying to prove that they were right" (de Kruif, 1926; p. 132). Winning this war had nothing to do with an individual not getting sick, or with a doctor saving the life of an individual patient; winning the war meant being the first researcher to discover which bugs caused which disease and how they did it.

Lewis Thomas points out an interesting linguistic phenomenon which historically supports the existence of this metaphor:

> "Cholera toxin" could be translated by an outsider new to our language as a bright and shiny bow and arrow. *Ghel* was at first the word for shining, later yellow; it turned to *ghola*, then *khole* in Greek, meaning bile, then into "choler" and "cholera" in English. "Toxin" was originally *tekw*, a word meaning to run or flee, later becoming *toxsa* in Persia and *toxon* in Greek, meaning bow and arrow; the toxin meaning may have come from the poison used to tip the arrows, or, as Robert Graves suggested, from the yew tree *taxus*, from which arrows were best made and whose berries were long thought to be poisonous.
> (Thomas, 1979; p. 59)

Important features of microbiology

This metaphor accounts for several important elements of microbiology. Three of the most important include:

1) an interaction focussed on two participants, yet in the context of a community

2) an interaction which follows precise, controlled rules

3) an aura of heroism

A key feature of the knightly combat metaphor is that it accounts for the highly individualistic nature of microbiological research. These researchers were not part of a huge, mass effort; like knights, they were individuals who engaged in individual combat. The early medical microbiologists worked alone, each investigating the particular organism of their choosing. However, just as the knights of the Round Table were part of a community linked by a vision of chivalry, a scientific community did exist in which the individual microbiologists participated as a group; for example, they all reported their work in a shared scientific literature.

While the medical microbiologists worked independently, their work was always in the context of this scientific community, which supported, connected, and validated their research:

> One of the great beauties of the scientific occupation is the pride of being a private in the great army of differentiators — the generals of which are never dead to their followers. Every objective gained, ever trench dug, every citadel conquered, is a permanent advance in organizing the new territory for the coming of the next integrator.
>
> (Zinsser, 1934; p. 44)

Of course, like the knights before them searching out the Holy Grail, the medical microbiologists competed with each other to see who could make a vital discovery first. Many times this led to rancor. One famous conflict took place between two doctor/researchers, Ronald Ross and Battista Grassi. De Kruif describes this conflict:

> Malaria must be wiped from the earth. Malaria can be destroyed! Because, by the middle of 1899, two wrangling and not too dignified microbe hunters had proved that the mosquito—and only one particular kind of mosquito—was the criminal in the malaria mystery.
>
> Two men solved that puzzle. The one, Ronald Ross, was a not particularly distinguished officer in the medical service of India. The other, Battista Grassi, was a very distinguished Italian authority on worms, white ants, and the doings of eels. You cnanot put one before the other in the order of their merit...So there is no doubt they helped each other, but unhappily for the Dignity of Science, before the huzzahs of the rescued populations had died away, Battista Grassi and Ronald Ross were in each other's hair on the question of who did how much. it was deplorable. To listen to these two, you would think each would rather his noble discovery had remained buried, than have the other get a mite of credit for it.
>
> (de Kruif, 1926; p. 266)

Another important feature of medical microbiology is that it attempts to adhere to the rigid rules of science; whenever possible, medical microbiologists made precise measurements, performed controlled experiments (Kean, 1978). An all out, no-holds-barred Vietnam sort of combat could not accurately depict the work of medical microbiologists. However, the metaphor of knightly war does highlights this; knights also followed strict rules of protocol in their quests and combat.

What is so heroic about medical microbiology that motivates a metaphor of knightly pursuits? Why is it glorious to pursue the dragon, to hunt the dread agents of cholera and plague? Several elements together create this fit: the nature of the work, the goal of medical microbiology as a field, and the nature of the enemy.

One feature of medical microbiology which contributes to the heroic metaphor has already been mentioned: the adherence to strict rules. Modern warfare, guerilla tactics, and surprise attacks are not heroic precisely because they lack such rules; knightly combat, on the other hand, with its commitment to the laws of chivalry, is truly heroic. Moreover, microbiology was a brand new field, fraught with risks; like the Crusaders, the microbiologists derived a great part of their glory from the difficulty of their pursuit and the small number of people who engaged in it. The microbe hunters of this era were few in number and poor in resources. Universities and corporations did not often fund their research; the microbologists had to do a lot of the research on their own, often in their limited spare time.

For example, Ronald Ross did his work on malaria in the midst of many obstacles. In his memoirs, he complained that he was not allowed to experiment on patients and that the principal medical officer persisted in putting him onto other duties than his research.

> He was ordered to Secunderabad, a desolate military station that sat between hot lttle lakes in a huge plain dotted with horrid heaps of rocks, and here began to work with mosquitoes. He had to take care of patients too, he was only a doctor and the Indian Government...would not for a moment recognize Ronald Ross as an official authentic microbe hunter or mosquito expert. He was alone. Everybody was against him...
>
> (de Kruif, 1926; p. 262)

Ross was soon posted to yet another city:

> At the beginning of September his malaria work received the first of its interruptions. He was posted to Bangalore on special sanitary duty, to help fight a cholera epidemic. Although this interruption was to last for 18 months Ross did not resent it. The work of combating the epidemic and of saving human life appealed to his practical nature.
>
> (Foster, 1965; p.172)

The small numbers of microbiologists and the precise nature of their work also allowed the identification of individual feats of heroism. Certain researchers became famous for certain discoveries, just as individual knights became known for particular conquests. Messengers and storytellers in the Middle Ages told the tales of the Knights of the Round Table; similarly, journalists and journals of the Golden Age of Microbiology spread the word about the exploits of the microbe hunters.

Travel is another part of the ontology of medical microbiology which fits the knightly war metaphor. Knights prefer to go on quests, looking for enemies to challenge; they don't stay at home patrolling the streets. Similarly, much of microbiological work in these early days involved long journeys to exotic foreign lands, trips during which the researchers incurred more difficulty and expense. Malaria, typhus, cholera - those who would study these diseases often had to go to the dragon's lair to do so. Sinclair Lewis captured the flavor of this sort of travel when he had his protagonist Martin Arrowsmith make a pilgrimage to the South Seas to find the cure to an outbreak of an unknown disease.

If the researcher does *not* travel, he will stay in the sanctity of the laboratory, forsaking family and other pursuits. Knights often took vows of chastity; the researcher takes a vow of purity. The laboratory is virginal, white, clean; it must be kept sterile in order to do experiments properly.

The notion of sacrifice is another belief shared by knights and microbiologists. Microbiologists like Koch and Pasteur were literally as well as metaphorically fighting the microorganisms; they risked their own lives in their investigations. In most cases no one even knew how the diseases were transmitted, so protection from contagion was difficult. The microbiologists worked not only with infected patients, but also with infected blood, water, anything they could get their hands on to study.

For example, as Koch and Pasteur raced to find the cause of cholera, Dr. Thuillier of the French commission died, "the first of the martyred microbe hunters" (de Kruif, 1926; p. 131). Many more medical microbiologists would die of the infectious disease they studied. The sobering list notably includes Englishman J.E. Dutton, whose promising career was cut short by the organism which he named, *Trypanosoma gambiense*, H. T. Ricketts, an American physician who first recognized *Rickettsia rickettsiae* as the cause of typhus and spotted fever, and Brazilian Oswaldo Cruz, who identified *Trypanosoma cruzi* as the agent of Chagas' disease (Foster, 1965; Braude, 1986).

Sacrifice sometimes meant sacrificing personal life, or the lives of others close to the researchers. Martin Arrowsmith's mentor, Gottlieb, called for his students to abandon all other pursuits in order to carry out their research.

Martin rejects this sacrifice in his youth, but ultimately makes another, more important sacrifice: his beloved wife, Leora, dies of the disease he is sent to study.

Like the Crusaders of the Middle Ages, early medical microbiologists saw their goal was a noble one, for the benefit of mankind. This goal was the capture, or better yet, the death of the enemy. Understanding how microorganisms caused infectious diseases was the first step, the capture; learning how to manipulate them so that they could not cause disease was the ultimate goal, the death of the enemy. This was the Holy Crusade of the medical microbiologists: to eradicate disease and save humanity. Consider the poem Ronald Ross wrote the morning after the breakthrough in his malaria research:

> This day designing God
> Hath put into my hand
> A wonderous thing. And God
> Be praised. At his command
> I have found thy secret deeds
> Oh million-murdering Death.
>
> I know that this little thing
> A million men will save—
> Oh death where is thy sting?
> Thy victory oh grave?
> (Foster, 1965; p. 177)

De Kruif describes Pasteur's speech on his eightieth birthday, exhorting a crowd of distinguished doctors and scientists at the Sorbonne to join the fight:

> At last the old microbe hunter gave his speech——the voice of the fierce arguments was gone and his son had to speak it for him——and his last words were a hymn of hope, not so much for the saving of life as a kind of religious cry for a new way of life for men. It was to the students, to the boys of the high

schools he was calling:

> "...Do not let yourselves be tainted by a deprecating and barren skepticism, do not let yourselves be discouraged by the sadness of certain hours which pass over nations. Live in the serene peace of laboratories and libraries. Say to yourselves first; What have I done for my instruction? and, as you gradually advance, What have I done for my country? until the time comes when you may have the immense happiness of thinking that you have contributed in some way to the progress and good of humanity."
> (de Kruif, 1926; p. 168)

Of course, a war metaphor depends upon identification of an enemy. A knightly war depends upon a special kind of enemy, a *persona* which psychiatry has called "the other"; a Saddam Hussein, a Hitler, an enemy who is nothing like the other side. Thus part of the conceptualization of medical microbiologist as knightly hero working towards the progress and good of humanity depended on an identification of an "other." The Crusaders identified the Eastern infidels as the "other." For microbiologists, this "other," this enemy, is the microorganism, an enemy which is not even human.

> When one sees cholera start from the banks of the Ganges and in the space of a few years devastate the greater part of the globe, following no rules in its unsteady and capricious march, crossing oceans and attacking pell-mell the various continents...one wonders what causes can account for such phenomena.
> (J. Gavarett, 1840; cited in Delaporte, p. 214)

As I noted in the previous section, most diseases are understood to come from some other place; this also fits in with identification of the "other." Microorganisms are also typically understood to have originated with another, heathen populace. In the late eighteen-hundreds and early nineteen-hundreds, the origin of this "other" was identified as Africa, Southeast Asia, and South America; the study of infectious diseases became known as

"colonial medicine" and then as "tropical medicine" (Donald Heyneman, 1991; personal communication).

This concept of "tropical medicine" depends upon the assumption that the microorganisms and the diseases do not really belong to America or Europe; instead, they are understood to have originated in primitive, tropical countries, on the bodies of primitive, tropical people. (This is ironic since Europe was devastated by the plague and syphilis centuries before the microbe hunters; obviously these diseases were not confined to the tropics.) Today in the United States, the specialty of medicine which works with plague, cholera, and other similar diseases is known as Infectious Diseases. However, traces of the "other" designation still remain; the most internationally prestigious school of public health, epidemiology, and microbiology is the London School of Tropical Medicine and Hygiene, which opened in 1899.

The denizens of the "other's" country often paid a high price for the success of the crusade against the bugs. The lives of the natives of the tropics suffering from infectious diseases were often sacrificed in the name of science. They became incidental, merely the animal-like objects upon which the Europeans practiced their war. Consider this passage describing the competition between microbiologists of two prominent European scientific communities to win the war against cholera.

> Then a strange race started between Pasteur and Koch, which meant between France and Germany, to search out the microbe
>
> of this cholera that flared threatening on the horizon. They toiled in dreadful rooms cutting up the bodies of Egyptians dead of cholera; in their muggy laboratory with the air fairly dripping with a steamy heat, sweat dropping off the ends of their noses on to the lenses of their microscopes, they shot stuff from the tragic

> carcasses of just-dead Alexandrians into apes and dogs and hens and mice and cats. But while these rival teams of searchers hunted frantically the epidemic began to face away as mysteriously as it came. None of them had yet found a microbe they could surely accuse, and all of them—there is a kind of twisted humor in this—grumbled as they saw death receding, their chance of trapping their prey slipping from them.
>
> (de Kruif, 1926; p. 129)

Here de Kruif casts the researchers as the heroes; even the tropical climate is the ally of their enemy, interfering with their fight against the cholera agent. He notes that they do not rejoice in the mitigation of the epidemic, the saving of thousands of Egyptian lives. On the contrary, he equates the natives of the tropics with animals, describing their bodies as carcasses and stringing "Alexandrian" into the list of dogs and cats; their lives are unimportant in the medical microbiologists' battle. This only makes sense if the real combatants are the microbes and the researchers. Moreover, if the battle cannot be fought unless the epidemic is present, then the battle cannot be won unless lives are lost.

Sinclair Lewis called attention to this in his fictional account of tropical medicine in *Arrowsmith*. Arrowsmith makes his pilgrimage to the island where a mysterious disease has broken out. In order to fulfill his charge, to find the source of and the cure to the disease, he could not treat the patients as individuals. Many of them had to die as part of a large control group, in order to prove the efficacy of his vaccine.

Motivations

As we have seen, Western cultures have a long tradition of understanding disease in terms of war. The pre-existence of a war metaphor for human disease in general is obviously one of the main motivations for MEDICAL MICROBIOLOGY IS WAR.

The discovery that microorganisms cause disease merely added a new combatant to this already warlike picture of medicine. In *AIDS and Its Metaphors*, Susan Sontag briefly notes medicine's change in metaphor, the transformation from what I have called the general HUMAN INTERACTION WITH DISEASE IS WAR metaphor to the more limited metaphor, MEDICAL MICROBIOLOGY IS WAR:

> Modern medical thinking could be said to begin when the gross military metaphor becomes specific, which can only happen with the advent of a new kind of scrutiny, represented in Virchow's cellular pathology, and a more precise understanding that illnesses were caused by specific, identifiable, visible (with the aid of a microscope) organisms
>
> (Sontag, 1988; p. 97)

The MEDICAL MICROBIOLOGY IS KNIGHTLY WAR metaphor depends on a coherence between the metaphors of society and medicine. In order for the metaphor to be rooted in normal English as well as medical language, society must see itself as the populace for whose benefit the microbiologists work; medical microbiologists are not knightly heroes to themselves alone. I believe that the United States' public support for the goals of medical microbiology has always been strong, because of a coherent metaphor, "the English and American concept of disease as invader" (Payer, 1988; p. 62).

Medical textbooks also clearly understand microorganisms as invading strangers to be evicted from the homeland of self: "Microbial and other foreign particles trapped within the adhesive mucus are removed by mechanical stratagems such as ciliary movement, coughing and sneezing." (Roitt, 1988; p.2)

For example, our public health policies have different goals than those of other countries. American public health goals focus on eliminating the disease, not at protecting individuals; as one doctor puts it, "You get money for stamping out diseases" (Pekkanen, ed., 1988; p. 32). Consider the rubella vaccine; most European countries vaccinate only prepubertal girls, the high risk group for developing the disease; in the United States, all children are vaccinated in hopes of wiping out the disease completely (Payer, 1988).

However, despite the coherence of medical and general metaphors, the use of this metaphor would probably not have become so pervasive if some of the early microbe-hunter doctors had not been able to win their battles. Medical microbiologists brought some of the first real successes to medicine, changing what had been a profession with limited ability to help patients into a powerhouse. De Kruif has compared what was in medicine versus what might be with Paul Ehrlich's "magic bullet":

> To cure them! Not by guess or by the bedside manner or by the laying on of hands or by waiting for Nature to do it—but how to cure them!
>
> (de Kruif, 1926; p. 311)

Once the medical microbiologists had won some battles, all of medicine could embrace their methods. With Ehrlich's "magic bullet," fighting infectious

disease with drugs, not just knowledge, became possible. No longer was war against disease limited to the few, knightly medical microbiologists. Encouraged by the success of medical microbiology against infectious disease, soon American medicine would declare war against all disease.

PART IV: The MEDICINE IS A GROUND WAR metaphor

OVERVIEW

> ...the Anglo American doctors generally espoused the doctrines of Benjamin Rush, scorning the healing power of nature "and firmly believing in direct and drastic interferences when confronted" by a sick patient, they gathered their purges and emetics, couched their lancets, and charged the enemy, prepared to bleed, purge, and vomit until the disease was conquered.
> (Duffy, 1979; p. 99)

I believe that the dominant metaphor in medicine today is the metaphor MEDICINE IS A GROUND WAR. The target domain, medicine, is understood in terms of the source domain, a ground war. As we will see, this metaphoric mapping is a rich one, complete with trenches, sieges, officers, and battlefields. We have the following metaphoric system:

SOURCE DOMAIN		TARGET DOMAIN
GROUND WAR	---------->	THE PRACTICE OF MEDICINE
THE ENEMY	---------->	DISEASE
THE SOLDIERS	---------->	HEALTH PROFESSIONALS
OFFICERS	---------->	DOCTORS
ENLISTED PERSONNEL	---------->	NURSES
WEAPONS	---------->	DRUGS
VIOLENT ACTIONS	---------->	MEDICAL PROCEDURES
THE BATTLEFIELD	---------->	THE PATIENT

The extent to which this MEDICINE IS A GROUND WAR metaphor is used is the extent to which a health professional views his or her role as the eradication of illness and disease. The purpose of this section is to demonstrate that this military model of medicine as a whole is an essential element of the current American medical system's understanding of itself and its relationship to the patient. Why this metaphor in particular? What does this metaphor reveal about medicine in the United States today? What does it conceal? What are the problems entailed by this metaphor? Do alternative metaphors exist? In the next sections I will examine these questions.

MOTIVATIONS

What motivates this MEDICINE IS A GROUND WAR metaphor? The general medical connection with war has been constantly reinforced by the history of medicine in the United States. Much of medical progress here has been linked to wars, from the development and refinement of anesthesia and surgery during the Civil War to the mobilization of mass produced antibiotics during World War II.

For example, the first significant American medical accomplishment in the twentieth century was achieved by a military officer, Major William Gorgas. Gorgas led a warlike campaign against yellow fever mosquitoes in Cuba and Panama, almost certainly saving the Panama Canal for the US. "The conquest of this dramatic killer disease was of inestimable value in terms of its economic, social, and psychological impact" (Duffy, 1979; p. 240). The Army Medical Corps was always at war, fighting for sanitation and disease prevention; further successes came in the elimination of two other expensive disease, pellagra and hookworm. (Duffy, 1979).

The roots of the war metaphor also lie in the American character in general, in its self-confident preference for action. This "can-do" approach was echoed in medicine. According to medical historian John Duffy, this aggressive approach has been the hallmark of American medicine since before the American Revolution. Benjamin Rush, one of the most influential American physicians and a signer of the Declaration of Independence, promulgated the attitude that medicine had been hindered in Europe by

over-reliance on natural healing; his experience with a yellow-fever epidemic convinced him that massive purging and blood-letting was the real answer. Martin Pernick also comments on Rush's influence on American medicine.

> Rush promoted his therapies in part by convincing practitioners and patients alike that they were heroic, bold, courageous, manly, and patriotic. Americans were tougher than Europeans; American diseases were correspondingly tougher than mild European diseases; to cure Americans would require uniquely powerful doses administered by heroic American physicians.
>
> (Pernick, 1983; p. 28)

Pernick adds that "frontier surgeons" like Nathan Smith and Ephram McDowell bragged that they were doing operations which European surgeons, lacking American spirit, had been too sensitive to perform. Payer has also speculated that the history of medical aggressiveness in the United States is bound up with our frontier mentality.

> [Medical aggressiveness] reflects an aggressiveness of the American character that has often been attributed to the effect the vast frontier had on the people (mostly Europeans) who came to settle it. The once seemingly limitless lands gave rise to a spirit that anything was possible if only the natural environment, with its extremes of weather, poisonous flora and fauna, and the sometimes unfriendly native Americans, could be conquered. Disease also could be conquered, but only by aggressively ferreting it out diagnostically and just as aggressively treating it, preferably by taking something out rather than adding something to increase the resistance. Disease might even be prevented by cleansing the environment of hostile elements.
>
> (Payer, p. 127)

Americans conquered the wilderness, cleared forests, broke the prairie, and dammed the rivers; in this tradition, they set out to conquer disease. Oliver Wendell Holmes also connects the workings of American medicine to its national character:

> How could a people which has a revolution once in four years, which has contrived the Bowie knife and the revolver...which insists in sending out yachts and horses and boys to outsail, outrun, outfight and checkmate all the rest of creation; how could such a people be content with any but 'heroic' practice?
> (Holmes,1888; cited in Payer, 1988; p. 127)

This American cultural bias towards aggressive action, in light of the success of medical microbiology at dealing with infectious diseases, provides the motivation for the spread of microbiology's underlying warlike conceptual metaphor to the rest of medicine. Microbiology has been extraordinarily successful at improving the physical health of Americans. As we saw in the previous section, success like this had been absent in much of American medicine; infectious diseases were one of the fist areas in which "can-do" medicine really could do something meaningful.

> I look at the track record for curing infectious disease and see that that is where the major progress in medicine has been in the last fifty years. First in public health, then in antibiotics, and then in vaccines. It's been the greatest curative revolution in the history of medicine.
> (Pekkanen, ed., 1988; p. 293)

Moreover, medical microbiology and its metaphors appealed emotionally to the American public and doctors because of the very nature of the diseases with which they dealt:

> "Infectious diseases," according to Dr. Zarday, "appeal to Americans because they can be conquered easily and immediately. An infection is purely external—no part of you. That's one reason Americans have had enormous success in infectious diseases."
> (Payer, 1988; p. 143)

This same fascination with medical microbiology as the touchstone of American medicine was even manifesting itself in American literature. As I

EVIDENCE

Evidence for the medical system's unconscious self-conceptualization as a military system is omnipresent in actual medical practice. I will begin with an examination of the structure of the basic unit of medicine, the hospital.

The hospital and its hierarchies

If the dominant conceptual metaphor in the medical system is MEDICINE IS A GROUND WAR, then we would expect that the hospital and the doctors and other health professionals who are fighting the battle would be organized in a way similar to the military. This in fact proves to be the case.

> All relationships within a hospital are based on the authority of one person over another. When medical students first arrive on a hospital ward, they immediately find themselves enmeshed in a pre-existing, well-defined system of hierarchical work relations. Taking their place alongside (or more likely in back of) staff physicians, residents and interns, students join the medical sector of the ward community, which—apart from patients—otherwise consists almost exclusively of people whose work supports the doctors in their therapeutic activities. The most visible members of this "ancillary" staff are the nurses. But there is no doubt that the most powerful members of the hierarchy are the doctors.
>
> (Shapiro, 1987; p. 81)

Obviously, even among doctors, the most powerful group of health professionals, a hierarchy exists, similar to the hierarchy within the officers' corps in the military.

> In spite of their apparent uniformity, however, profound differences among them in rank and status divide the medical men and women of the hospital. The hierarchy ranges from the lowly first or second-year medical students fumbling through their first physical examination, to the chairman of a major

> clinical department with, perhaps, an international reputation. Between them are many gradations of knowledge, skill, and authority.
>
> (Shapiro, 1987; p. 90)

In this "between" spot are the newly graduated doctors, referred to as "residents" or, if they are in their first year, "interns." Typically they have the worst hours and the most difficult work load; many residents I know work up to 100 hours a week, and depending on their "service" (the department in which they work), they are often on call every other night.

> During an internship, young men and women are asked to take on the responsibility of life and death, are pushed to the limits of physical and emotional endurance, and are watched constantly for the first sign of error; it is the crucible in which all physicians are created. It is the most hated and most loved year in any doctor's life.
>
> (Dan and Young, eds., 1988; p. 59)

A recent California law attempting to "limit" resident hours to 80 per week and to limit call to every third night has met with significant resistance from hospital administrators and many other doctors, who feel that this "short" work period would make it impossible for residents to do or learn their jobs adequately.

Residents are responsible for the majority of actual patient care decisions in a hospital as well as for the day-to-day teaching of third and fourth year medical students. At the top of their ranks is the "chief resident." Residents long to finish this element of their training and attain the status of the cadre of specialists who supervise them, the "attending physicians." The attendings have worked their way up the hierarchy of physicians in training; their call schedule is usually light or non-existent.

Attendings are not the top of the totem pole, however. They are still subject to the authority of "the Chief," the chairman of a clinical department. The Chief usually controls most major decisions, including salaries, hiring, firing, research priorities, etc.

> While the relative rank of attending physicians is expressed in different ways in different institutions, the absolute power of the Chief is consistently characteristic of clinical departments. In this respect, the difference between other departments of a university and those in the hospital is quite startling. Elsewhere in the university, a chairman of a department is generally considered to be the first among equals; in the hospital, the chairman is king of kings.
>
> (Shapiro, 1987; p. 91)

I suggest that this difference, as well as the rest of the hierarchical structure described above, is due to the divergence between the metaphors of medicine vs. academia. Unlike academia, medicine has a rigid hierarchy, structurally *and* linguistically coherent with a military metaphor.

Officers and orders

All the residents and interns working in a hospital are lumped together by the term "house officers" or "house staff." Different house officers work for different "services," or medical departments (e.g. surgery, pediatrics, internal medicine, psychiatry). The terms "house officer" and "resident" suggest that doctors actually live at the hospital; in fact, these terms are left over from an era in medicine when this was literally true.

> In the past, many programs prohibited interns even from being married. They were made to live in the hospital (interns and residents still bear the name "house staff"), and many interns were required to work every day and every other night.
>
> (Dan and Young, eds., 1988; p. 59)

Many residents and interns today still spend more time working at the hospital than many people spend at home; conceptualizing the hospital as a residence still makes sense. But what kind of residence is the hospital? Is the hospital anything like a military barracks? In fact, the house officers have their own Officer's Quarters, the doctors' lounge and the "call-rooms" where doctors sleep while waiting for emergencies, waiting to be called to battle by the ever vigilant enlisted troops at the front. To complete the military picture, like enlisted troops, the nurses usually have their own separate quarters into which "officers" do not go unless invited.

These "enlisted troops" consist of nurses and all the other health professionals. That nurses ranked lower in hospitals than doctors was, until recently, formally acknowledged in a military manner; nurses rose to attention when an "officer," or doctor, entered the room (Shapiro, 1988; p. 108).

One of the most important items of linguistic evidence for the military metaphor, the concept of the "order," further highlights this distinction between officers and enlisted personnel. "There is one phrase that attests to the dominance of physician's over patients and other health workers as well: Doctor's Orders" (Shapiro, 1988; p. 170). Doctors, the house officers, give "orders" about patient care to the nurses; these orders are either given orally or written in the patient's chart.

Without these orders, nurses are extremely limited in their activities; even in emergencies, or when they know what the doctor would order, they must

wait to act until they get the house officer's order. Martin Shapiro describes one such incident in *Getting Doctored*:

> The nurses recognized the patient's problem instantly. They paged the physician and gave the appropriate supportive care, but they could not give the medications until the doctor came. For ten crucial minutes the physician did not appear, despite frantic and continued paging throughout the hospital. With the patient seated upright, tourniquets applied and oxygen flowing, the nurses could do little else. They started an intravenous infusion of sugar water so that medications could be admnistered. They drew up the required medications in appropriate dosages into syringes and stood poised by the patient's bedside. When the physician finally sauntered in, he gave the necessary permission for the potentially life-saving injections.
>
> On this occasion the patient might have died because the rigid hospital hierarchy did not allow nurses to administer treatment on their own, even when they had the competence and experience to do so and even when, as in this case, there was no one else around to do it.
>
> (Shapiro, p. 104)

These enlisted personnel have their own hierarchy as well, with the registered nurses essentially serving as sergeants and overseeing all the other non-coms: licensed vocational nurses, physicians' assistants, patient care assistants, phlebotomists, nutritionists, laboratory technicians, X-ray technicians, etc. Just as sergeants often are the ones with the expertise and battle experience in the army, doing the work while the officers get the credit and promotions, nurses play a crucial but seldom acknowledged role supporting the doctors.

Uniformed Services

Uniforms are another aspect of the hierarchy: "...every worker in the hospital wears a uniform that is a direct reflection of rank" (Shapiro, 1987; p. 86). All

health professionals wear uniforms, with different branches of the service having their own distinctive style. These styles obviously vary in different hospitals and states. Shapiro describes the same phenomenon at his hospital in Canada. He notes that the social stratification is most easily observed in the cafeteria, where people's seating depends on where they stand in the hierarchy:

> Maintenance and housekeeping staff wear green uniforms; thus the first row of tables in the Royal Vic cafeteria is a sea of green. Other hospital workers, most of whom wear white, would appear almost to be soiling themselves were they to sit amongst people so obviously "unclean"! These green-costumed workers are mostly recent immigrants; the social bariers between them and the rest of the staff merely reinforce the ethnic tensions and the linguistic barriers that also complicate interaction.
>
> Nurses wear white. Nursing students are denied this honour; they must settle for pink or blue outfits. Resident staff and senior medical students wear white shirt and pants. Junior medical students on some electives are also allowed to wear "whites," an opportunity few pass up. Some senior residents emulate the attending physicians and wear long coats. Admnistrative staff wear street clothes.
>
> (Shapiro, 1987; p. 86)

While the particulars of this sort of medical uniform hierarchy may change, the importance of the uniform is invariable. In my experience at teaching hospitals in Northern California, the more casual the uniform, the higher the prestige. Attending physicians most often wear street clothes. Residents wear at most a white coat, and sometimes green surgical scrubs, even when not in surgery; in contrast to the situation Shapiro describes in Canada, in California hospitals green is a sign of prestige.

Even differences in the length of doctors' white coats can be read as differences in prestige, just as clearly as number of stripes on a military officer's jacket identify rank. For example, at Stanford University, the medical students may only wear the very short (and highly impractical) waist-length jackets, almost a bolero-style. As they progress to residency, the jackets can come down to hip length. Only the attendings are allowed to wear full length white "coats." (Scott Parazynski, 1988; personal communication.) In all the hospitals in which I have experience, orderlies and nurses have to wear much more restrictive and identifiable uniforms than do doctors.

> Not only does this hierarchy define matters of authority and power, but it also provides an apparent limitation of contact between the different levels of worker. Albert Wessen, who did a study some time ago of communication between doctors, nurses and other health workers on the ward of a hospital, detailed what he called "an almost caste-like set of segregatory patterns." The patterns, according to Wessen, "quite effectively limit informal interaction between hospital personnel of different ranks". ...there has been little change in the system since Wessen did his study.
>
> (Shapiro, 1987; p. 81)

Women

All of these hierarchical distinctions are strained when the stereotypical relationships are threatened. Like the military, the medical profession is distrustful of any attempts at change. For example, the rapidly-growing presence of women in the medical profession simply does not fit with expectations. Historically, women associated with medicine have been non-professional volunteers (as during the Civil and Spanish-American Wars) or later, as nurses (Duffy 1979). Women were expected to remain in these subordinate positions, but are suddenly now appearing within the officers' corps. Women officers in the military are similarly few and far between, with

the similar contrast to large numbers of women in the lower, support echelons of military service.

Women's roles in medicine are gradually expanding, but most women feel the profession still discriminates against them in many subtle or not-so-subtle ways.

> Medical training is constantly a process of proving yourself, but I think the rules are different. Women are judged inferior until they prove themselves equal, and men are judged equal until they prove themselves inferior.
> (Pekkanen, ed., 1988; p. 12)

Bootcamp

Those who enter the military must undergo bootcamp in order to instill the proper fear of and respect for the officers and for their profession. Medical training is structured and experienced like one long bootcamp.

> But medical school is very regimented and very grueling. You start at the bottom of a very long ladder, and nobody has time for you or your concerns or to treat you well.
> (Pekkanen, ed. 1988; p. 25)

Socialization of medical students begins immediately, as we are told to master overwhelming amounts of information or be failures. After two years of basic sciences, med students go on to their clinical years, where we are often told that we will learn best under fire.

> Others stated that the only way to "toughen up" prospective physicians for the difficulties they will encounter in their careers and to screen out those who would not make it was to put them through this type of training.
> (Dan and Young, eds., 1988; p. 115)

Combat

Then comes residency. One doctor compares it directly to a battle experience:

> When you become an intern or resident—a house officer—your ego really gets bruised. You are asked to work much longer than is tolerable. You are cannon fodder. You are asked to do all kinds of menial things because you are in a position where you can't say no. You are treated with contempt.
>
> (Pekkanen, ed. 1988; p. 26)

One doctor, S. Walker, published a famous article, "The Harvard Way," in the "A Piece of My Mind" column of the *Journal of the American Medical Association (JAMA)*.The article decried the harsh conditions and dehumanization during the surgical residency at Harvard. The response to this article also uses a military metaphor:

> "The Harvard Way" generated a good many letters to *JAMA*. Among them were those who agreed with Dr. Walker's assessment of the often arduous and sometimes harsh conditions that interns and residents speak about. Some compared the treatment to that dished out by Marine drill instructors.
>
> (Dan and Young, eds., 1988; p. 115)

Turf wars

Medicine is divided into specialties, just as the military is divided into the Marines, Army, Navy, Air Force, and other special forces. Doctors in different specialties are as argumentative over their relative worth and turf as any military service branch. The editor of *M.D.: Doctors Talk About Themselves* summarizes this conflict:

> Conflicts between doctors may also extend into entire specialties. The plastic surgeons I spoke with are angry at dermatologists and ear, nose, and throat (ENT) specialists for moving in on their territory. They argue that the dermatologists and ENT surgeons aren't trained in plastic surgery and shouldn't be doing it. Dermatologists insist they are well trained to do many

> procedures—such as liposuction to surgically contour localized fat deposits—and that plastic surgeons just want to have the whole pie. They accuse the plastic surgeons of being elitist. Ditto for the ENT surgeons.
>
> There are other skirmishes. Radiologists snipe at internists and other nonradiologists who own office X-ray machines. Money isn't the issue, one told me; it's simply that these other doctors aren't trained to know how to read X-rays...There are long-standing antagonisms between internal medicine specialties and surgery. Many doctors I spoke with took swipes at psychiatrists, although no one took harder swipes at psychiatrists than other psychiatrists. And nobody seems to understand pathologists, whom other physicians sometimes characterize as doctors who love diseases and hate people.
>
> As one doctor understated, "It's not like we're one big happy family."
>
> (Pekkanen, ed., 1988; p. 37)

One of the anonymous doctors in *M.D.: Doctors Talk About Themselves* comments that tension is increasing between doctors in high-paid specialties and those in low-paid specialties.

> It's always been covert and smoldering, but it's more than smoldering now. There's real anger and a real feeling not only that the high-paid specialists—like surgeons, radiologists, and anesthesiologists—are screwing the internists and other low-paid specialties but also that they are blowing it for the profession by making us all look greedy.
>
> (Pekkanen, ed., 1988; p. 159)

Rank and title

The linguistic evidence for the MEDICINE IS A GROUND WAR metaphor also extends to the United States Public Health Service (USPHS), which is overtly structured as a military entity. The USPHS was originally known as "the Corps," and had military-styled rank, pay, and retirement regulations (Donald Heyneman,1991; personal communication). This reflects its ideological and historical roots in microbiology and infectious diseases:

> Physicians have always been involved when man waged war with his fellow man. In fact, the Surgeon General of the United States retains that title from the early days of military medicine. The Surgeon General is not only head of the US Public Health Service but Commander-in-Chief of the Commissioned Corps, part of the Uniformed Services. That is why you will see him decked out in his uniform—a naval uniform, because the Public Health Service started out as part of the US Navy in 1798. All Commissioned Corps officers carry a military rank, and many of the doctors and nurses who work at the Centers for Disease Control (CDC) in Atlanta, Georgia, the National Institutes of Health in Bethesda, Maryland, the Food and Drug Administration in Washington, DC, and the other venues of the Public Health Service carry a military commission—and can be called up without notice to serve in times of national crisis.
>
> (Dan and Young, eds., 1988; p. 92)

One of the most visible physicians in the United States is known as "The Surgeon General"; this physician is selected from the ranks of public health physicians by the government. "Surgeon General" is a double honorific, made up of not only the overtly military title, General, but the less obvious military title of Surgeon. The Surgeon General is typically *not* a practicing surgeon. Similarly, doctors in the United States Air Force are referred to as Flight Surgeons, although they often are not surgeons either. Interestingly, both military doctors and public health doctors are some of the lowest prestige doctors in medicine:

> There is also a bias among doctors against those who do not practice clinical medicine, and especially those in public health. It is as though the "real doctors" are the ones who do something with a patient. Especially among surgeons, everyone else is suspect.
>
> (Harrison, 1982; p. 155)

Surgeons, on the other hand, have high prestige, in terms of both respect and income. This prestige probably motivates the use of the term "surgeon" as an

honorific in medicine, which in turn further promotes the importance of MEDICINE IS A GROUND WAR. Their profession is also historically closely allied to the military, and surgeons are particularly likely to use the MEDICINE IS A GROUND WAR metaphor. As one surgeon said,

> But I really think of surgery as deep in history, like the long gray line at West Point.
> (Pekkanen, ed., 1988; p. 245)

William Nolen compares his work to that of the military in his autobiography, *The Making of A Surgeon*:

> Every operation is a team event. A surgeon can no more operate on a patient by himself than a general can fight a war alone. An operation, like a battle, is a cooperative venture.
> (Nolen, 1968; p. 217)

Another doctor compares the psychological difficulties of surgery to battle experience.

> When a colleague of mine has a problem with a patient, it reminds me of some of the psychological studies that came out of World War II. They hadn't understood why soldiers felt a momentary euphoria when a buddy of theirs was killed. It turned out that the euphoria was because it wasn't them. We go through some of the same thing, in neurosurgery especially, because we're always on the edge of losing or harming patients. I don't wish my colleagues any ill, but I almost have a sense of relief when something goes wrong with one of their patients because it didn't happen to me.
> (Pekkanen, ed., 1988; p. 51)

SPECIFIC MAPPINGS

Now that we have seen evidence for the general metaphor, MEDICINE IS WAR, let us examine some of the evidence for the individual mappings I have proposed: DISEASE IS THE ENEMY, HEALTH PROFESSIONALS ARE SOLDIERS, DRUGS ARE WEAPONS, MEDICAL PROCEDURES ARE VIOLENT ACTIONS, and THE PATIENT IS THE BATTLEFIELD.

The enemy

In medicine, disease is the enemy. Medical students are invariably told, "Treat the patient, not the disease"; the ubiquity of this warning suggests that the focus is often otherwise.

> The causes of most diseases are straightforward. A cold is caused by a virus; hemophilia by a faulty gene; lung cancer by cigarettes. If medicine's job is not always easy, it is clear-cut: to identify and fight the cause.
>
> (Andreopoulos, 1990; p. 23)

This is an important point which must be accounted for by any conceptual metaphor for medicine: the focus of modern American medicine and of medicine's treatment is the disease, not the patient.

The understanding of disease as the enemy is rooted in the more general metaphor discussed earlier, HUMAN INTERACTION WITH DISEASE IS WAR. This understanding is an example of personification, a kind of metaphor which assigns human qualities to something that is not human. An early example of personification comes from a medical treatise on the cholera epidemic of 1832, in which cholera is seen as a sly strategist, planning

the invasion of France: "In its march it unmasked itself to kings and peoples and revealed to them its mission, which is to decimate us" (Lauvergene, 1836; cited in Delaporte, 1986; p. 217). Medical science even describes the "evolutionary strategies" of particular organisms, as if they had evolved just to battle mankind.

This personification of disease as the enemy is also what makes sense of phrases like, "Measles kills," "His high blood pressure finally caught up with him," "Cancer got her in the end," or "Alzheimer's disease ruined his life." One large billboard in on Telegraph Avenue in Oakland currently warns, "Measles kills. Save the ones you love! Vaccinate!" In each of these examples, the disease is grammatically identified as the subject which acts out the verb; the disease kills, catches up, etc. Each disease is understood metaphorically as a particular sort of person, a hostile enemy, chasing after people to cause them pain and suffering. These examples also demonstrate that we understand the effects of disease in terms of actions, the records of which are inscribed on patients' bodies.

A similar personification, combined with the perception of illness as identifiable, motivates an interesting medical term: "silent disease," as in "Hypertension is a silent killer." According to *Dorland's Illustrated Medical Dictionary*, "silent" means "producing no detectable signs or symptoms; noiseless" (Taylor, 1988). For example, a person with high blood pressure may have no obvious symptoms of disease and then suddenly have a myocardial infarction and die.

A disease can be silent because we conceptualize diseases as human actors.

Diseases are identifiable, therefore they are understood not simply as enemies, but as enemies which make themselves known, which speak loudly to announce their presence. This "announcement" is made through the medium of the patient's body and doctors must be able to "hear" this announcement, again through the medium of the patient. Silent diseases are thus those which do not make themselves known, those which even professionals cannot hear knocking. Like assassins, silent diseases are particularly threatening because they strike unexpectedly; neither patient nor doctor has any warning of danger.

Soldiers

> "I don't want to sound like a sentimental fool, but there is a sense of calling to the practice of medicine."
> Medical school dean
> January 1988
> (Dan and Young, eds., 1988; p. 59)

This calling, at least at the beginning of a medical career, has to do with giving to others.

> ...the medical school class seemed to contain so many remarkable people, overflowing as they were with idealism and empathy. They seemed well-suited to making substantial contributions to the world as caring physicians.
> (Shapiro, 1987; p. 5)

Clearly, many doctors see themselves as working together with other health professionals for the common good of society.

> When I asked doctors what their biggest reward in medicine was, most said helping patients and doing some good for people. For many and perhaps most doctors, that transcends money and prestige. That is the Hippocratic ideal that doctors should live up to and that many do live up to. It means they should stay up

> later at night, get up earlier in the morning, and put personal needs aside for the good of their patients....The Hippocratic ideal may also involve serving the poor and disenfranchised, advancing medical knowledge, or being committed to day-to-day caring for and sensitivity toward troubled and frightened patients. In a word, to live by the spirit of the Hippocratic oath means giving of oneself for the good of patients and society.
> (Pekkanen, ed., 1988; p. 242)

A metaphor to conceptualize the behavior of health professionals must be coherent with this self view. The war metaphor highlights this by mapping the source domain of an army onto the target domain of health professionals; since an army is understood to act by sacrificing itself to protect society, the mapping makes ontological sense. A headline in the *New York Times* on April 11, 1987, demonstrates this mapping: "DOCTORS, FIGHTING THE WAR ON AIDS, FIND THEY ARE AMONG THE CASUALTIES" (cited in Pekkanen, ed., 1988; p. 73).

Tools of the trade

The medical world sees drugs as weapons used to fight disease and its causes. For example, doctors still commonly employ a military term in common discussion:

> [Doctors use] the word *armamentarium* to describe the tools used to diagnose and fight disease: are they not great military strategists masterminding the movements of their footsoldiers in the battle against the Enemy?
> (Shapiro, 1987; p. 170)

Drugs considered to be particularly potent, like the new generation antibiotics, are referred to as "the big guns" (Nigro, 1991; personal communication.) The language to describe medical procedures also demonstrates the MEDICINE IS WAR metaphor; the procedures are described as violent actions.

> When patients are to be given medication, this is sometimes expressed as *hitting* them with it; if the medication is given by intravenous infusion, it is called an *I.V. push*. Occasionally, the administering of a large dose of a medication ifs referred to as *zapping* the patient, but zapping more usually describes the use of electric countershock in the effort to resuscitate a person who has had a cardiac arrest.
>
> (Shapiro, 1987; p. 170)

A comparison of a military journal like *Armies and Weapons* with a medical journal demonstrates astounding similarities. Both medicine and the military go to a lot of trouble to document just how well their tools and procedures work. Medical journals are filled with clinical trials comparing different types and dosages of drugs as well as different styles of procedures; military journals compare weapons and strategies.

Both journals are also filled with advertisements selling products by emphasizing their military might. For example, McMillan and Longmire have noted that the name of every anti-cancer drug seems to be chosen to suggest the potency of the drug; each has a "dynamic anti-cancer ring" (McMillan and Longmire, 1978; p. 1288). These authors spoof this trend in their article, referring to imaginary drugs called "WHAMMO" and "SOCKO" which are to be given to a patient at the "Northnortheast Oncology Atack Unit."

Shapiro has also noted the aggressive sound to most drug names:

> Brand names of pills (like those of any other marketed goods) are not chosen haphazardly..."Big Job" medications have harsher names: Keflin (an antibiotic recommended for use in certain serious infections), Hyperstat (for reducing blood pressure in an emergency), Cytoxan (used in the treatment of some cancers.)...
>
> (Shapiro, 1987; p. 177)

Medical advertisement copy also appeals to the military metaphor. For example, Ceclor (cefaclor), a medication for respiratory tract infections by Eli, Lilly, and Co., is sold under the headline, "The respiratory tract under fire..." This copy appears over a collage in the shape of lungs, made of photographs of people smoking (Ceclor, 1991; see Figure 1).

Pfizer Labs sells Procardia XL (nifedipine) under the copy headline, "A VICTORY IN ANGINA." The copy below this reads, "Your patients are vulnerable to anginal attacks every hour of the day and night..." (Procardia XL, 1991; see Figure 2).

Similarly, Roche's advertisement for Librax (chlordiazepoxide and clidinium bromide) shows a picture of two groups of soldiers, arrayed in formations in the shape of the large bowel and the brain. The copy says, "In IBS (irritable bowel syndrome), when it's brain versus bowel, IT'S TIME FOR THE PEACEMAKER. In irritable bowel syndrome, intestinal discomfort will often erupt in tandem with anxiety — launching a cycle of brain/bowel conflict. Make peace with Librax." (Librax, 1991; see Figure 3).

The battlefield

If the primary combatants in the medical war are the doctors and the disease, where does that leave the sick patient? Clearly, not as a major figure in the health care conflict. Yet the patient must be involved somehow. I believe that the best interpretation of the current medical paradigm is that the patient is simply understood as the ground over which the battle between doctors and disease is fought; the patient's own *experience* of the illness is usually

irrelevant. In other words, current medical understanding reflects an unconscious mapping which can be described as THE PATIENT IS THE BATTLEFIELD.

In *The Birth of the Clinic*, Foucault describes modern medicine's clinical gaze as moving over three dimensions, seeing disease as "a set of forms and deformations, figures, and accidents and of displaced, destroyed, or modified elements bound together in sequence according to a geography that can be followed step by step" (Foucault, 1963; p. 136). I suggest that the medical conceptualization of the patient's body as "geography," described by Foucault, is simply a less precise form of the PATIENT IS A BATTLEFIELD metaphor. This metaphor seems to describe accurately the way both patients and doctors experience their interaction. Who would have heard of the Tet, Borodino, Midway, or Gallipoli were it not for battles having taken place in those places? The battlefield is often only important because of the battle; similarly, patients are treated as if they are only important to medicine because they have a disease. Let us look now at the evidence for the battlefield metaphor in more detail.

The doctor's training: anatomy

Training medical students to think of the patient's body as a land mass starts early. In most medical schools, the student's first patient is a cadaver. Our introduction to the patient occurs in gross anatomy lab, and our first lectures about patients are not about caring or developing a patient/doctor relationship, but about how best to navigate these bodies. Anatomy teaches us as medical students to see bodies as countries, around which we must learn to find our way. A common remark in the anatomy lab is "I'm lost. Can you

show me where the (gastroduodenal artery/duct of Santorini/splenic flexure, etc.) is?"

In a doctor's training, the mastery of anatomy plays a tremendously large part, both academically and emotionally. I believe that much of the importance stems from the strategic importance of the battlefield in a war; anatomy draws the map we will need to fight disease.

> "Indeed, the notion that the anatomy lesson serves as modern medicine's logo is not at all fanciful when we consider how often we see reproductions of the frontispiece of Vesalius's *De Humani Corporis Fabrica* (Plates 2.1 and 2.2) on the walls of places where medicine does its work. Choulant, in 1852, described the frontispiece of *De Fabrica* with an anatomical precision that Vesalius no doubt would have applauded: "Vesalius standing beside a dissecting table upon which there lies a female body with the abdominal cavity opened; Vesalius' left hand with the forefinger raised, his right hand holding a pointer and resting upon the cadaver; at the head of the body a skeleton standing erect with a long staff in its right hand. Surrounding these is a large assembly of people of different classes. On the left, in the window, stands a nude man clinging to a column, while at the bottom on the right, we see a living dog brought in." Choulant's purified and objectifying language conveys, to a degree, that we are looking at a public display of medical virtuosity. Apparently, such public dissections were not uncommon during the Renaissance. What Choulant's language does not convey is the way the configuration of this great piece of Renaissance art identifies the principal elements of modern medicine.
>
> (Arney and Bergen, 1984; pp. 13-16)

The picture that Arney and Bergen are discussing is still an important icon of medical education. I was exposed to this picture numerous times during my medical training, the first time in the end leaves of my first-year anatomy text, Clemente's *Anatomy: A Regional Atlas of the Human Body*. The significance of Vesalius' drawing and of anatomy's role in medicine is that

both draw the doctor's attention to a non-experiencing, dehumanized patient. The message is that medicine needs only the clinical gaze to do its job; medicine does not need to hear the experience of the patient, but can function successfully simply by finding one's way about the body, by knowing the right way to look.

> "Looking" dominates the frontispiece of the Fabrica. There is first of all what is being looked at: death in the form of the silent, anonymous cadaver. The cadaver is the central figure of this picture. Its abdomen has been opened so that everyone can peer in and see; it is as if death itself has been put on display...Second, there is Vesalius. He is a instantly distinguishable figure. He does not look like the crowd, nor does he look into the cadaver. He looks out at us as if he were extending an invitation.
>
> (Arney and Bergen, 1984; p. 17)

This is an invitation which medicine has accepted wholeheartedly. American medicine has learned not only to explain disease and death by looking at organ pathology, but also to explain illness in the living person by detecting hidden anatomic changes, using technology such as the microscope, X-ray, computer assisted tomography (CAT), magnetic resonance imaging (MRI) and PET scans. Moreover, medicine is essentially independent in this search for disease. The doctor does not really need the active cooperation of the patient, all that is needed is that the patient should lie still so that the doctors can look for signs of disease.

In *Medicine and the Reign of Technology*, Reiser describes the impact that an eighteenth-century Italian physician, Morgagni, had on this process:

> Morgagni established two premises that became fundamental to the education and practice of future generations of physicians. First, disease often leaves telltale footprints on the tissues of the body; second, study of these footprints is the best way for

> physicians to verify judgments made on the living, and the key to achieving clinical excellence.
>
> (Reiser, 1978; p. 17).

This passage is a classic example of the medical conceptualization of disease as the enemy and the patient as the battlefield: disease inscribes footprints upon the land-mass of the patient's body. A patient's symptoms are merely the sign-posts that guide the physician through the battlefield.

> This new structure is indicated—but not, of course, exhausted—by the minute but decisive change, whereby the question: "What is the matter with you?", with which the eighteenth century dialogue between doctor and patient began (a dialogue possessing its own grammar and style), was replaced by that other question: "Where does it hurt", in which we recognize the operation of the clinic and the principle of its entire discourse.
>
> (Foucault, 1963; p. xviii)

Foucault ascribes a great deal of importance to the question "where" in medical discourse; this further supports the idea that medicine conceptualizes the patient as a battlefield. Once the doctor has seen the signposts, found bearings, then the battlefield can be analyzed, the conflict entered into, and the nature of the enemy described. This alliance between medical seeing and saying, looking at the patient in order to find the truth about the patient's disease, "subtracts the patient as an experiencing person from his body" (Arney and Bergen, 1984; p. 27).

Arney and Bergen further describe the results of the separation of medicine from the patient through an analysis of the Vesalius frontispiece

> The nude figure clinging to the column in the upper left of the woodcut is probably the live model on which Vesalius illustrated external anatomy during the same lesson he displayed the internal anatomy of the corpse. The figure looks like he would flee the scene if possible, but he cannot. The

> anatomy lesson locked his vitality in the same scene with death. Yet this figure is the only one in the entire picture that is artistically barred from its central area. The lighting of the scene creates a gulf between the nude and the rest of the action.
> (Arney and Bergen, 1984; p. 19)

This nude represents medicine's patient, terrified, forced to be part of the scene, yet not invited to actively participate in the battle being carried on over his body.

The doctor's training: basic sciences

After anatomy, medical school teaches students the rest of the basic medical sciences: biochemistry, histology, pathophysiology, medical microbiology, immunology, and pharmacology. Classes in immunology and medical microbiology reinforce medical student's conceptualization of the patient as a battlefield, making use of the rich system of war metaphors described in the earlier sections. Once we learn to think of a patient's infection as a "colonization" of the body by bacteria, we find it easy to think of other diseases as invaders. Soon even non-infectious diseases are being described by means of the war metaphor:

> In the hospital she suffered a cardiac arrest from pericardial tamponade, a condition brought on when the pericardial sac around the heart fills with blood and constrict's the heart's ability to beat. I think it may have been caused because her leukemia had begun to invade her heart.
> (Pekkanen, 1988; p. 61)

The format of basic science instruction in medical school also fits an unconscious conceptualization of medicine in which the protagonists are doctors and disease, while the patient is little more than a battlefield.

Traditionally, medical students' training in the basic sciences is organized around diseases completely separate from the patient.

More recently, "innovative" medical schools have re-organized their courses into a "system-based" program; the only change is that now all the basic science information about diseases of a particular anatomical region are discussed in the same time period. Of course, this is an improvement over the earlier methods, in which pathology would be teaching us kidney diseases while pharmacology was teaching drugs for asthma; nonetheless, the doctors-in-training are taught to focus their gaze on the disease, not the person with the disease.

Introduction to clinical medicine

Medical students' academic introduction to clinical medicine is also based on categories which are disease-based, not person-based. A careful look at the table of contents of a basic textbook of clinical medicine illustrates this point. Chapters are organized by diseases: Skin and Appendages; The Eye; Pulmonary Diseases; Fluid and Electrolyte Disorders; Infectious Diseases; Disorders due to physical agents (cold, heat, shock); Poison; Medical Genetics, etc. Sub-headings are even more specific; for example, the chapter on pulmonary diseases is divided into sections on disorders of the pulmonary circulation, disorders due to chemical and physical agents, pleural diseases, interstitial lung diseases, etc. (Schroeder, et al., 1989)

This table of contents, taken from the Lange series *Current Medical Diagnosis and Treatment*, demonstrates the disease-based approach to understanding medicine. Essentially, in a disease-based format, the variety of

subcategories of illness considered to be within the medical domain tend to be organized by their etiology or their location.

One other approach to teaching clinical medicine exists. In contrast to the disease-based approach, problem-based formats organize illnesses according to their presentation and how they are experienced by the patient. For example, the table of contents for a problem-based textbook such as Little, Brown, and Co.'s *Problem-Oriented Medical Diagnosis*, reads as follows: General Problems, Dermatologic Problems, Respiratory Problems, etc. Subheadings include edema, fever of unknown origin, weight loss, etc. Subheadings under respiratory problems (equivalent to the pulmonary disease section above) are particularly instructive, because they represent actual symptoms experienced by patients: shortness of breath, wheezing, cough, hemoptysis (bloody sputum), etc. As the problem-based book says in its introduction,

> Most textbooks of medicine are organized in terms of diseases rather than patients, and properly so. Such books, however, do not provide the methodology for proceeding from symptoms, signs, or abnormal laboratory findings to the diagnosis of disease. This text, which gives the diagnostic approach to the problems presented, should help to bridge the gap. It is intended to supplement, not to replace, conventional textbooks of medicine.
> (Friedman, 1987; p. xiii)

This introduction has a curiously cautious tone; a certain modesty is apparent, probably because the editors were conscious that their text is not part of the dominant medical paradigm.

Problem-based learning has recently been proposed for the basic sciences in general. The curriculum at McMaster University is 100% problem-based; other medical schools using problem-based curricula in varying proportions

include Case Western, Harvard, Tufts, The University of New Mexico, and the U.C. Berkeley-U.C.San Francisco Joint Medical Program (Heyneman; personal communication). Students are presented with what essentially amounts to clinical word problems, case descriptions of patients with certain problems. From an analysis of the cases, students use more general information they have read in a textobook and hope that its application will result in good understanding and retention of the material.

Interestingly, the problem-based approach is still considered "experimental." Dr. Charlotte Jacobs, senior associate dean of education and student affairs at Stanford University, was recently interviewed about innovative teaching techniques at Stanford. Commenting on the difficulty in getting faculty to adopt these methods, she admits, "The traditional way our generation was taught in medical school was by lectures, so that's what we're comfortable with" (Joyce, 1991; p. 8). Lectures teach the student to know the disease, not the patient; lectures are just another small way the MEDICINE IS WAR metaphor manifests itself in medical training.

Use of the battlefield metaphor continues and magnifies when the academic training is put into practice in the clinical years. Suddenly, patients are no longer the academic, somewhat unreal subjects of case histories that other people talk about; now medical students are confronted with living, breathing patients. But two harsh years of preclinical training has taught medical students to conceptualize patients almost exclusively in terms of the war metaphor. Harrison describes the attitude towards patients she found in her clinical years at a big city hospital: "Patients, primarily black and Puerto Rican,

were bodies on whom we, white and privileged, practiced" (Harrison, 1982; p. 1).

House officers also reinforce and perpetuate the metaphor, teaching medical students to talk as they talk. Students are not about to challenge the status quo, even if they are uncomfortable with the way they see medicine treating patients; accordingly, they accept their superiors' language and the way of thinking it entails.

Finally, after all this training, medical students must choose a specialty in which to do their residencies. Even the naming of these specialties resonates with the military. The branches of the military are named associating them with the geographic space in which they fight. "Navy" is from *navis*, Latin for ship. "Army" is from *arma*, literally, Latin for defensive weapons for hand-to-hand combat on land; the term came to mean lightly armed troops. "Marines" comes from *mare*, the sea, and "Air Force" is self explanatory. Similarly, medical specialties are defined according to the anatomical terrain over which the doctors do battle: gastroenterology (the gastrointestinal tract), cardiology (the heart), rheumatology (the joints), dermatology (the skin), etc. Pathologists and radiologists are like military intelligence, without a defined zone of military operations themselves, they help the other forces plan strategy.

Talking about patients

The way doctors talk with each other about patients is probably the best evidence of the patient as battlefield metaphor. Anspach has studied the

language of case presentations, situations in which a doctor, usually the lowest ranking present, describes to an audience of other doctors a particular patient's illness and the care given that patient.

> In fact, the subject of sentences—and the real object of medical intervention—is not the patient, but diseases and organs (this phenomenon appears to exist in other settings, described by Donnelly, 1986 and by Frader and Bosk, 1981). The ability to "see" diseases, tissues, and organs as entities apart from patients, also a recent historical development, is what Foucault (1975) calls "the clinical mentality." In its most extreme form, the language of case presentation treats the patient as the passive receptacle for the disease rather than as a suffering subject.
>
> (Anspach, 1990; p. 334)

This description of medicine's treatment of the patient is essentially a picture of the metaphor I have called THE PATIENT IS THE BATTLEFIELD.

In more informal situations, doctors use other names for patients. Medical students find learning these names are an important part of the socialization process of medicine.

> It is important not to appear square. Referring to patients as "patients" instantly exposes you as un-hip. Learn the lingo of the wards...Diseased patients, too, carry colorful appellations, shockers, juicers, bleeders and wheezers to name but a few.
>
> (Polk, 1986; p. 41)

These names are based on the patients' symptoms; they would never be used in patients' hearing. Other less offensive patient identifications have to do with the patients' diseases - the schizophrenic, rather than Mr. Jones; the diabetic, not Mrs. Smith. In the conceptualization of medicine according to MEDICINE IS WAR, medicine is interested in the patient because the patient has a disease. Accordingly, medicine refers to the patient in terms of that disease, rather than by personal name.

Surveillance

The MEDICINE IS A GROUND WAR metaphor takes the concept of identifiable disease and maps onto it the additional notion of surveillance. In a war, identification of potential enemies is the duty of every good citizen; if disease is an identifiable enemy, then that the enemy *should* be identified. This is what motivates health education projects with slogans like "Know the warning signs of skin cancer" and "Learn to identify venereal disease." The body must be watched for signs of infiltration by the enemy.

Similarly, a doctor describing how best to work with colon cancer patients comments that "We must keep the patient under constant surveillance" (Internal Medicine Update, 1990). Clearly, the patient's body is conceptualized as a particular kind of battlefield, an occupied territory, colonized by invaders, under surveillance not only by its own immune system but also by the medical world.

The nursing profession is increasingly responsible for this surveillance. A KQED television program on nursing interviewed a number of nurses who expressed dissatisfaction with their jobs. One nurse described how she "read" the equipment, the IV lines, the blood pressure monitor, before she even looked at the patient; she complained that the demands of nursing now prevented caring. This nurse had no time to connect to the patient because she was so busy looking for signs of the enemy, those telltale footsteps on the body's tissues (Nursing, 1990).

Public health efforts are also oriented towards surveillance. Every week, for example, the Atlanta Centers for Disease Control (CDC) put out a bulletin on disease "outbreaks" all over the United States, called the "Morbidity and Mortality Weekly Report." Medical journals publish abbreviated versions of these bulletins under titles highlighting their purpose in surveillance. For example, in *The Western Journal of Medicine*, this section is called "Alerts, Notices and Case Reports"; in *The Journal of the American Medical Association*, the section is entitled, "Leads From the Morbidity and Mortality Weekly Report." An entire division of the CDC is even assigned to keep watch on the enemy, the "Epidemiological Information Service"; these people travel all over the world in order to diagnose new outbreaks.

Blaming the battlefield

Medicine's treatment of pregnant mothers seems to be particularly prone to the conceptualization of the patient as battlefield. A leading obstetrician in the 1920s described birth as a violent conflict taking place in the maternal fortress.

> Pomeroy called the fetal head "a battering ram" which "shatter[s] a resisting outlet," and arguing for the use of episiotomies, he asked rhetorically, "why not open the gates and close them after the procession has passed?"
>
> (Arney and Bergen, 1984; p. 23)

Michelle Harrison describes modern obstetrics' view of the patient in similar terms:

> The doctors have set up a relationship between themselves and the unborn child that does not include the mother. If these doctors don't care whether a woman uses natural childbirth or has epidural anesthesia, it is only because she has been written off, and her experience, whether she is awake or asleep, is irelevant. She is the maternal environment. They are frustrated only that they cannot control her more.
>
> (Harrison, 1982; p. 117)

This frustration makes sense given the mapping, THE PATIENT IS THE BATTLEFIELD. Like Napoleon criticizing the field at Austerlitz, the doctors are frustrated with the imperfections of the battlefield with which they must deal, the maternal environment.

Another instance of blaming the battlefield occurs when a treatment does not work.

> Yesterday on rounds I saw a baby with a cut on its face and the mother said, "My uterus was so thinned that when they cut into it for the section, the baby's face got cut." The patient is always blamed in medicine. The doctors don't make mistakes. "Your uterus is too thin," not "We cut too deeply." "We had to take the baby" (meaning forceps or Caesarean), instead of "The medicine we gave you interfered with your ability to give birth."
> (Harrison, 1982; p. 157)

Again, blaming the patient in this way makes sense in the context of a conceptualization of the patient, in this case the mother, as battlefield. Criticism of the battlefield in a war is perfectly acceptable and may even explain a loss. Similarly, the doctors, who must wage their battle on the body of the patient, voice their dissatisfaction with the patient as fighting terrain and use the battlefield conceptualization to explain their mistakes.

Similarly, if chemotherapy does not succeed in destroying the patient's cancerous cells, the event is conceptualized as the fault of the patient. Patients like this are said to have "failed chemotherapy." For example:

> I had been taking care of a young woman who had leukemia when I was attending on oncology-hematology. She had failed multiple courses of chemotherapy, and she was very ill and in the final stages of dying. (Pekkanen, 1988; p. 61)

The term "piss poor protoplasm" is also used to convey the medical sphere's critical opinion of a patient as battlefield. In *Getting Doctored*, Shapiro describes the use of this term:

> This term, not particularly malicious, is used to describe patients who have disease or failure of several organs or organ systems. It is often said jokingly when a person is succumbing to disease on several fronts. It seems to indicate a regard for the patient as something less than a thinking and feeling human being.
> (Shapiro, 1987; p. 168)

Hostility

Arney and Bergen have commented on the criticism that medicine treats people as objects: "This commonplace critique of medicine does not carry much analytical power. Indeed, once we understand that scientific medicine based its work on indifference, not hostility, toward the patient, this criticism loses much of its rhetorical power" (Arney and Bergen, 1984; p. 50). Conceptualization of the patient as a battlefield indeed perpetuates the attitude of indifference in medicine. However, hostility towards the patient is not unknown, and medical hostility is also coherent with the MEDICINE IS A GROUND WAR metaphor.

We have already seen examples in which the patient was blamed for medical problems, due to reasoning based on mapping the patient as the battlefield. Blaming the patient easily segues into hostility towards the patient. Moreover, since the patient "carries" the enemy, disease, the patient sometimes becomes identified as that enemy. The author of *The Medical Student's Survival Guide*offers this advice about terminology:

> It is plain that an admission to the service makes work and worry for everybody. This is why those dread events have come

> to be known as "hits."...Here's an example of a phone conversation between a ward team's resident and intern.
>
> "Deckard, speaking."
> "This is Bryant. We've been hit."
> "How bad?"
> "Four. The first is a gomer...Second hit is a three-time loser ..."
> (Polk, 1986; p. 41)

This passage is meant to be funny; young doctors will certainly recognize the attitudes expressed. Nonetheless, it reveals a disquieting fact: in certain situations, doctors can experience patient contact as "hits," attacks directed at them.

A related form of the war metaphor is also used in emergency rooms; doctors sometimes warn other members on the medical team of arriving patients by yelling "Incoming!" This is an expression borrowed from the military experience of being on the receiving end of enemy shelling; whoever realized a bomb was coming shouted "Incoming." The term "gomer" is also a response to these perceived attacks; the word is an acronym for the way doctors sometimes feel about repeat patients: "Get Out of My Emergency Room!"

Allies

For most medical purposes, the patient is treated as the battlefield. If medicine does notice the patient as a person, this person is still connected to the battlefield, inhabiting the contested ground. Neutrality is not tolerated; the expectation is that patients themselves will behave as if they are allies on medicine's side. Patients may be described as being "on the team," the medical squad fighting disease, until they are kicked off for bad behavior—engaging in

the same behavior that brought them to the hospital the first time, for example. (Polk, 1986; p. 40.)

Doctors often speak pejoratively of patients who "give up" or "don't fight"; "the patient who beats cancer is considered superior to the patient who fights but succumbs, who is in turn superior to the patient who refuses to fight." (Payer, 1988; p. 133). Doctors tend to be more sympathetic towards patients they perceive to be behaving as allies in the fight against disease:

> There were so many patients like this. One man was in his fifties—a nice man, a real fighter—who came to me with a lot of problems. He ended up undergong multiple operations.
> (Pekkanen, 1988; p. 91)

This patient fits into medicine's war metaphor nicely; a fighter, who allows his body to be the site of medicine's military operations. Others fit into the metaphor less well.

> He had given up. He'd apparently decided that life wasn't worth the fight and that it was too much pressure on his wife to come in to the hospital every day and see him so ill. I think he felt he was a burden to everyone.
> (Pekkanen, 1988; p. 200)

While this patient may indeed have felt he was a burden to everyone, the doctor may also have been projecting internal feelings onto the patient; a patient who won't fight is a burden in a medical war.

HIGHLIGHTING AND HIDING

The MEDICINE IS A GROUND WAR system of metaphors is so conventionalized that we may find it difficult to think about medicine except as war. However, we must keep in mind that the metaphorical concept of medicine only gives us a partial understanding of what sickness, disease, doctors, patients, and treatments are. If the metaphorical structuring were total, then medicine would actually be war, not just understood in terms of war.

> The very systematicity that allows us to comprehend one aspect of a concept in terms of another (e.g., comprehending an aspect of arguing in terms of battle) will necessarily hide other aspects of the concept. In allowing us to focus on one aspect of a concept (e.g., the battling aspects of arguing), a metaphorical concept can keep us from focusing on other aspects of the concept that are inconsistent with that metaphor. For example, in the midst of a heated argument, when we are intent on attacking our opponent's position and defending our own, we may lose sight of the cooperative aspects of arguing.
>
> (Lakoff and Johnson, 1980; p. 10)

As we shall see, the war metaphor highlights certain ontological elements of the medical target domains while obscuring others.

Sickness and Disease

In a war, the enemy is understood to wear a standard uniform or behaves in a stereotypical way; by mapping "the enemy" onto disease, the MEDICINE IS A GROUND WAR metaphor highlights the outwardly identifiable quality of disease. The "clinical gaze" discussed earlier is simply a way to identify signs of the enemy's presence on the battlefield of the body.

Disease manifests itself as sickness. The identification of disease is essentially a *gestalt* perception of sickness. We have a single mental image for "sick", an overall look which can be rapidly assessed. Most of us feel we can pick out sick people by the way they look and act; we all have told someone or been told, "You don't look sick." However, most of us are not able to make evaluations of "sick" or "not sick" consistently or in ambiguous situations. Diseases such as chicken pox can be picked out by anyone; others, such as influenza, need a professional to identify them.

In fact, doctors pride themselves not only on being able to pick out a sick person, but also on being able to tell exactly how sick that person is and why. Many medical diagnoses rely to a surprising extent upon a *gestalt* evaluation of "how sick" the patient is. For example, as medical students we have heard one clinical pearl several times: a patient with appendicitis will "look really sick." At one point during medical school, I was diagnosed with appendicitis by a university doctor and sent to a surgeon; knowing I was a medical student, he took extra time to discuss my diagnosis with me. His clinical assessment? I did not have appendicitis because I "just wasn't sick enough."

A similar clinical dependence on "sick" occurs in diagnoses of liver diseases: "Clinical recognition is of great importance because in all, save the Crigler-Najjar I syndrome, the individuals are "more yellow than sick," and so the jaundice should not be construed as a manifestation of a serious hepatic disease" (Cotran, Kumar, and Robbins, 1989; p. 919).

The war metaphor thus places emphasis on "looking sick," the outward

identifiability of the disease; this hides the reality that diseases are often not in fact outwardly observable, as in atherosclerosis or parasitic infection.
Moreover, the military metaphor fosters the attitude that one can never be sure; an expert is necessary to identify the enemy (Communist or not Communist, for example). By focusing on the professional identification of disease, the war metaphor de-emphasizes the individual's ability to assess their own health. People learn to go the doctor to find out *if* they are sick, rather than feeling comfortable assessing this for themselves: "Am I sick, doctor?"

Disease is generally understood negatively. From the frame of society, illness as a result of disease is a drain on resources, time, productivity. Illness, the experience of disease, is also a negative experience from the frame of the individual, a limiting factor in leading a normal life. The MEDICINE IS A GROUND WAR metaphor highlights these negative qualities of disease, but only in an abstract way. The metaphor looks at disease from the frame of society, by casting disease as "the enemy" and medicine as the army which fights for the benefit of society. The negative impact of the disease on the life of the individual is de-emphasized by the mapping of patient as battlefield or even as ally, because in either case the individual's needs are subordinated to that of society.

The ontology of disease also involves issues of responsibility and control. A disease in our society is usually understood to occur without the active involvement of the patient. As mentioned earlier, synonym for disease in England was originally "visitation," an unwanted visit from an uninvited and invading force. According to the Oxford English Dictionary, one

definition for visitation is "The action, on the part of God or some supernatural power, of coming to, or exercising power over, a person or people for some end...so as to afflict with sickness or other trouble, especially by way of punishment for wrong-doing" (Simpson and Weiner, 1989).

In certain periods of history, however, disease was thought of as a punishment for various sins, and even today some elements of society still believe certain diseases are punishments. A critique of this sort of metaphoric understanding is the basis of Susan Sontag's *Illness as Metaphor* and *AIDS and Its Metaphors*.

Nonetheless, in most situations, we Americans tend to understand disease as originating outside of us and as being outside of our control. In other words, disease is not the fault of the sick person. Like IMMUNOLOGY IS WAR, the MEDICINE IS A GROUND WAR metaphor reinforces the American conceptualization of disease as coming from outside.

> The American regards himself as naturally healthy. It therefore stands to reason that if he becomes ill, there must be a cause for the illness, preferably one that comes from without and can be quickly dealt with.
> (Payer, 1988; p.139)

Since we also understand war as an attack from an outside enemy, the "other," the MEDICINE IS A GROUND WAR metaphor fits. The metaphor focuses attention on the "otherness" of disease, its origin "elsewhere." On the other hand, the metaphor obscures the exceptions to the rule that diseases come from outside. Emphysema, lung cancer, hypertension, and atherosclerosis, for example, are in fact highly linked to individual behavior;

far from being visitations from "the other," these diseases are to a large extent within the control of the self.

Doctors and Patients

This issue of responsibility also plays out in the roles mapped by the war medicine onto doctors and patients. The war metaphor, with its patient as battlefield mapping, highlights a passive role for patients and a more active role for doctors. This mapping highlights doctors' responsibility for winning or losing the war, while downplaying the patient's involvement as well as other, non-medical factors that may go into a person's continued illness or recovery.

Many doctors have trouble managing their own lives; drawing boundaries between their personal and professional lives is extremely difficult. Studies note the high incidence of suicide, substance abuse, and marital failure among physicians (Roeske, 1981; McCue, 1982). This makes sense, given the self-sacrificing ethos of the MEDICINE IS A GROUND WAR metaphor

> While most doctors consider it a privilege to practice their profession, they recognize the risks. Not only can their work be consuming, but many worry deeply over patients. They suffer burnout, grief, guilt, anxiety, and high levels of stress because of their work...There are other hazards. It has always been a tradition in medicine to serve patients, even at risk to yourself. Doctors and other health care workers have historically exposed themselves to viruses, bacteria, radiation, and other occupational hazards. The list of physicians who have contracted work-related hepatitis and other infectious diseases is long. Many have died from these infections. And for the foreseeable future there is the specter of AIDS, a disease that burdens many doctors as they have never been burdened before.
>
> (Pekkanen, ed., 1988; p. 76)

The MEDICINE IS WAR metaphor puts the emphasis on physician sacrifice

in saving the patient. This neglects the fact that doctors themselves have personal needs and emotions which must be met in order for them to perform their jobs on a long-term basis. Wars are usually fought by soldiers with a high turn-over rate; even the Vietnam War, considered to be a long-drawn out war of attrition, was fought by men on tours of duty lasting a matter of months. Doctors, however, are expected to practice medicine for their lifetimes; the MEDICINE IS A GROUND WAR metaphor hides this important fact. The war metaphor also emphasizes the emergency nature of the medicine, the urgent call to battle in a crisis; this may explain why the metaphor seems to work best in surgery and emergency medicine.

The active role of the doctor highlighted by the war metaphor contrasts with the passive role mapped for the patient. The word "patient" has meanings which directly suggest passivity, according to the *Oxford English Dictionary*. Consider these definitions:

> 1. A sufferer; one who suffers patiently...
> 3. A person subjected to the supervision,care, treatment, or correction of someone...
> 4. A person or thing that undergoes some action, or to whom or which something is done...[for example] "He that is not free is not an Agent but a Patient."
> (Simpson and Weiner, 1989)

In a similar vein, the 1988 *Random House Dictionary* lists the following as synonyms for patient: invalid, uncomplaining, long-suffering, forbearing, unruffled, self-possessed, and composed.

While *Dorland's Illustrated Medical Dictionary* simply defines patient as "a person who is ill or who is undergoing treatment for a disease," the broader

definitions above better reflect the actual expectations for patient behavior. In my experience, health care workers typically criticize patients who question their medications, complain of discomfort, or want to do things on their own like going to the bathroom instead of using a bedpan. These people are referred to as "bad patients." "Good patients" are those who fulfill medicine's expectations of the sick role by letting medicine work on them without questioning the process.

Wars are understood to involve casualties in the field; ultimately the war is decided when one side feels they have sustained too many losses. Each soldier in a war who becomes ill is another sort of loss; the war effort is weakened that much more by each absence. Accordingly, illness is frowned upon within the military, and soldiers are encouraged to tough it out. When a doctor becomes ill, a similar mentality prevails. The MEDICINE IS A GROUND WAR metaphor puts so much emphasis on doctors' responsibility in the fight against disease that physician health problems are poorly tolerated.

For example, while medicine calls patients with substance-abuse problems "addicts" or "alcoholics," physicians have come up with a special term to describe members of their profession with substance-abuse problems: "impaired physicians." In other words, physicians understand patients in terms of their disease, but understand themselves in terms of their functions. A carpenter addicted to heroin is not an impaired carpenter, a teacher with a drinking problem is not an impaired teacher; this is due to the primary understanding of that person with the disease is AS THE DISEASE.

Doctors who are addicted to drugs, however, are not understood by other doctors nor by themselves in the same way as other substance abuse patients. At the most basic level, doctors apparently understand themselves within a professional context. If they are sick, the primary concern in their minds seems to be loss of ability to do their jobs as physicians. (For example, they don't suddenly become impaired wives, lovers, sons, fathers, or mothers.) By highlighting the soldierly responsibilities of doctors, the war metaphor puts an emphasis on doctors staying at their posts under any circumstances; this conceals the reality that even doctors get sick.

When the doctor must become a patient, the doctor is faced with a scenario which cannot co-exist in his or her cognitive understanding of the roles of ill patient and healing physician. To become the passive battlefield over which medicine fights is intolerable. Doctors always talk about what "bad patients" other doctors make, because the physician-patient does not just lie there quietly, but annoys the medical team by asking questions, making suggestions, and generally getting involved in self-care. The contradiction between doctors' self-view as the protagonist in a conflict, and doctors' views of patients as battlefields typically results in the supremacy of the doctor's self-view.

Treatments

Sontag has described the use of war metaphors in public health. In this passage she criticizes a Italian post-World War I poster about tuberculosis :

> In [one] poster, "With These Weapons We Will Conquer Tuberculosis," the figure of death is shown pinned to the wall by drawn swords, each of which bears an inscription that names a

> measure for combating tuberculosis. "Cleanliness" is written on one blade. "Sun" on another. "Air." "Rest." "Proper food." "Hygiene." (Of course, none of these weapons was of any significance. What conquers—that is, cures—tuberculosis is antibiotics, which were not discovered until some twenty years later, in the 1940s.)
>
> (Sontag, 1988; pp. 97-98)

Sontag cannot avoid the same metaphoric thinking she condemns; she assumes that in order to conquer - or, as she catches herself, cure - disease, one must have good weapons. Like a military supplier, she argues that antibiotics are the only "real" weapon which can conquer tuberculosis. Her criticism of these early public health posters is for their ignorance in what kind of weapon to support, not for suggesting the concept of weapons in the first place.

In reality, the posters were not so far off as Sontag suggests. Sun, air, rest, food, and hygiene are in fact powerful preventive medicine; they just don't fit Sontag's (and medicine's) unconscious metaphor about what kind of treatment is necessary to halt the spread of disease: potent, targetable weapons.

This poster probably was not very effective at motivating prevention, because sun, air, and hygiene are just not easily mapped by a source domain of weapons. Treatments are understood by health professionals to be potent and efficacious ways to cure or at least, alleviate particular illnesses. Medical treatments are also understood to be specific, targeted towards specific diseases. The power and specificity of the treatments is highlighted by the MEDICINE IS A GROUND WAR metaphor, because modern military weapons are understood to be efficacious and targetable.

Of course, this hides the fact that medicine does not even know why many drugs work. For example, administration of gold-compounds is the best treatment for rheumatoid arthritis, but no one has been able to explain exactly why. Far from being specific and targetable, many drugs simply happen to have a desired effect, often found more by accident than by careful medical research. Minoxidil, for example, is a drug currently sold for hair loss; it was originally an anti-hypertensive drug, found fortuitously to have side-effects of hirsutism.

The MEDICINE IS A GROUND WAR metaphor also conceals the existence of a different focus of medical treatment, prevention. Preventive medicine looks to the *terrain* to moderate the spread of disease, attempts to improve the human's resistance to disease, rather than to bring in some outside agent to act against the disease itself. The metaphor also obscures the existence of an alternative view of medicine, in which medicine uses its treatments not to fight disease or the cause of disease, but rather in order to improve patients' well-being.

PROBLEMS WITH THE MEDICINE IS WAR METAPHOR

The cost of medicine's wholesale adoption of microbiology's war metaphor is that *medicine is forced to adopt the understanding implicit in its language.* Some of the major problems with this understanding concern the philosophical positions that are entailed by the metaphor: medicine's objectives, strategies, and definitions of success. Other problematic entailments concern issues of empowerment and meaning in medicine. I will discuss each of these problems in turn.

Objectives

One philosophical question concerns what medicine considers to be important. If medicine is unconsciously conceptualized as a war, then military objectives become legitimate.

> So there's money to transplant somebody's heart and money to separate Siamese twins. But try to get the money you need to keep an eighty-year-old woman in her home with the medicine she needs to live. There's no glory in that, and there's no money for the patients or for the doctors taking care of them.
> (Pekkanen, ed.,1988; p. 158)

This doctor obviously sees nothing unusual about glory being an objective of medicine; in fact, he recognizes that the lack of glory in caring for an elderly patient is what causes medicine's failure to support that type of care. High technology operations, on the other hand, are opportunities for medical glory; like high technology military operations (themselves referred to metaphorically as surgical strikes), surgery is sterile, efficient, impressive, and photogenic. Best of all, surgery has clear outcomes. Surgery, not geriatrics or

family practice, gets the press coverage, and its practitioners become household names.

Winning is the primary objective of war; the entailment of the metaphor is that "winning" becomes important to medicine. The first problem is that this entails a conceptualization of the war against disease as *winnable*to begin with; a normal expectation of those who declare war is that they can win that war.

The problem with this particular entailment of the war metaphor can be demonstrated when it is used to deal with the increasingly common phenomenon of chronic illness. MEDICINE IS A GROUND WAR suggests that disease can be defeated; the implication is that an endpoint, success or failure, winning or losing, can be determined. This may be true in a limited view of a surgical procedure, such as a heart transplant, but is certainly not true of chronic diseases.

> So I had a notion that being a doctor was fighting death, saving people's lives, outthinking disease.
>
> It turns out that's not what happens in medical practice —at least, not in internal medicine, which is what I'm in. Being a good doctor means being incredibly compulsive. It has nothing to do with flights of intuition or brilliant diagnoses or even saving lives. It's dealing with a lot of people with chronic diseases that you can't really change or improve. You can help patients. You can make a difference in their lives, but you do that mostly by drudgery—day after day paying attention to details, seeing patient after patient and complaint after complaint, and being responsive on the phone when you don't feel like being responsive.
>
> (Pekkanen, ed., 1988; p. 72)

In chronic diseases like diabetes, ulcerative colitis, asthma, and psoriasis, day-

to-day management, not ultimate cure, must be the goal.

> Successful coping, furthermore, is not something that can be achieved outright, once and for all. Patients and families, and, what is more, practitioners, too, struggle to cope on a daily basis...It is even uncertain what successful coping means in any generic sense apart from an individual's particular experience in a particular local context.
>
> (Kleinman, 1988; p. 144)

Patients who don't respond to medicine's treatment and who become chronic users of the health care system simply don't fit into the war metaphor. They are battlefields on which the war is being lost, and they distract the doctors from more successful ventures. Medicare won't even pay for the health care of patients who are considered "incurable," so diseases like Alzheimers', arthritis, and other geriatric problems are poorly handled, as is rehabilitation (Payer, 1988; p. 137). As mentioned earlier, medicine describes these repeat users of the medical system with an unpleasant appellation:

> A nationally known generic term for loathsome low-lifes whose sole reason for being is to be admitted to a teaching service in as wretched and disgusting a condition as possible is "gomer." This is an acronym for "get out of my emergency room!"
>
> (Steven Polk, 1986; p. 41)

Another area where the "winnability" entailment breaks down is in the area of childbirth. While medicine has not yet consciously characterized the problem in terms of metaphor, encounters with the legal profession and malpractice suits have demonstrated to medicine that "success" is a problematic area. Under some opposition, medicine has succeeded in taking childbirth fully into its domain; yet by medicalizing birth, doctors have created the expectation that sick babies are not a normal part of life. Since medicine is fighting a war against illness, medicine is expected to win. This

has led to the refusal on the part of the parents to accept what obstetricians now call "bad outcomes." In a war, if a battle is lost, the officers, their strategy, and their weapons are questioned or blamed; today, when a baby is born with Down's syndrome, parents are increasingly putting the blame on medicine.

Success

We have seen that one entailment of the MEDICINE IS A GROUND WAR metaphor is that the war against disease is winnable. But what does medicine understand winning to be? If medicine is unconsciously conceptualized as a war between the doctors and disease, then medicine's winning must be related to how well doctors handle a disease, rather than how well they handle the condition of patient. A successful doctor is thus one for whom a particular illness has no surprises, one who knows all there is to know about a particular disease and uses that knowledge to control that disease. Thus we have the following mappings:

SOURCE DOMAIN		TARGET DOMAIN
WINNING THE WAR AGAINST DISEASE	---------->	UNDERSTANDING AND CONTROLLING THE DISEASE
LOSING THE WAR AGAINST DISEASE	---------->	FAILURE TO UNDERSTAND AND/OR CONTROL THE DISEASE

Keeping this mapping in mind, consider these two observations by doctors:

> I've seen doctors get annoyed as hell when a patient lived for a year or two after the doctor had predicted they'd be dead in three months. These guys hate being proved wrong more than they enjoy seeing a patient live longer.
> (Pekkanen, ed., 1988; p. 40)

> I had a patient come to me who had had a growth removed from his neck about two months before I first saw him. The doctor who removed it told this patient that the growth was malignant before he took it off. It turned out to be benign, and my patient swore to me that the doctor was furious because he had been wrong. Doctors get off on strange things, they really do.
> (Pekkanen, ed., 1988; p. 43)

On first glance, these quotes describe attitudes which seem antithetical to medicine. However, these stories do not seem so strange or surprising in the light of MEDICINE IS A GROUND WAR. Any doctor socialized with that unconscious conceptual metaphor would be expected to be very concerned with being wrong about the outcome of a particular disease or treatment; being wrong about a disease is losing the battle.

Another entailment of mapping the source domain of war onto medicine is that assumptions about how wars are won are mapped onto medicine. The folk model of war suggests that wars can be won by strength of character. ("Waterloo was won on the playing fields of Eton.") The daughter of a cancer patient wrote a letter to the *New York Times Magazine* criticizing the magazine's use of the term "cancer victors" for people who had "beaten cancer": "When you refer to one group of people as 'victors,' what would you call the others?" She points out a problematic implication,

> that 'winning' against cancer is some sort of holy crusade, and that victory is simply a matter of will. What, then, is he implying about those who fought back but did not 'conquer'?
> (Abberman, 1984)

Valuing success at any cost is another philosophical position that has been mapped from the military domain onto medicine. A famous old joke plays upon this: "The operation was a success, but the patient died." Similarly, the

success-at-all-costs attitude provides the motivation for a treatment like chemotherapy, one that may prolong life by a few months but invariably causes massive discomfort for the patient. In the following passage, for example, a medical student questions the treatment of a man with liver cancer. The author uses a military metaphor, TREATMENTS ARE WEAPONS, describing the chemotherapy as poison.

> [The patient's] oncologist was optimistic about the upcoming chemo.
>
> "What'll it give him?" I asked. " A year and a half?"
>
> "Not that long," he said. "More like a year."
>
> "*Just one year*?" And for that, I thought, we give him poisons until he's continuously nauseated. Why don't we just give him pain meds and let him die at home?...Our chemotherapy did not help Mr. Sweeney. Instead, it pushed him over the edge by damaging his remaining few healthy liver cells: after one treatment he became jaundiced and nearly comatose. He pulled through but never returned to his admission baseline...And the next afternoon, while I was in the next room drawing blood (successfully this time) on another patient, Mr. Sweeney died.
>
> (Chinman, 1988; p. 32)

Since American medicine is founded on a war metaphor, American medicine sees this patient's treatment as sensible. Since the treatment controls the disease, it is successful; destroying the remainder of the patient's life is not as important a consideration.

An attitude valuing success at all costs seems to be particularly prevalent in the field of neonatology, the care of newborn infants born premature or with other complications.

> But now I feel that my ability to use my judgment with parents and their babies has been taken way from me, in part by the government and the law but mostly by the machines, by the

> shiny promise of what they can do to keep not just life going but also existence going...This is going to sound hard-nosed and maybe even a bit callous, but if all the people in neonatology who think about and agonize over the issues we are involved with moved out of the field, we would be left with the people who think it is perfectly okay to keep anything alive on the ventilator for years. And there are plenty of those.
> (Pekkanen, ed., 1988; p. 68)

Another doctor comments on the difference between the success-at-all-costs attitude doctors have towards patients, and their attitude towards themselves when they become terminally ill.

> Somehow we've got to figure a way out of this. We've gotten so entangled with medical technology that we don't see the difference between maximum care and optimum care. There are no clear ethical guidelines, and a lot of docs just shrug away from it.
>
> But the whole situation changes when a physician is the patient. There is no fear of malpractice, and no one is going to rip him off, and doctors rally around and close the doors and inject him with morphine. They let him go quietly and peacefully. I've seen it happen time and time again.
> (Pekkanen, ed., 1988; p. 68)

Strategies

In war, each side attempts to kill as many of the other side's soldiers as is necessary to win; war is a violent, physical act. If medicine is conceptualized as war, then medicine comes to be conceptualized as violent and physical. Health care strategies become focused on the physical, for example. The mapping of the target domain, disease, by the source domain, enemy, further emphasizes the physical threat of disease. The war metaphor does not have a convenient mapping for mental illness or for the psychological components of a physical illness. Since studies have shown that approximately

approximately half of patients visit their family doctor because of primarily psychological concerns, this is an important breakdown.

The focus on physicality is also manifested in funding priorities. People who need kidney dialysis, for example, are covered by government programs in most states, but many people with mental illness have no access to the kind of care they need.

Even when mental health patients do have access to care, that care is most likely to be physical; a depressed patient getting treated in a public hospital is unlikely to receive any in-depth, consistent psychodynamic therapy - drugs are a far more likely treatment. Drugs fit because medical treatments, like weapons, must be conceptualized as physical. This has especially important ramifications for mental illness and for the medical care of chronic disease, in which the psychological aspects of the disease are among the most amenable to treatment.

The nature of these drug therapies in the United States has also become militarily aggressive:

> The dosages in psychiatry are particularly high, sometimes as much as ten times those used elsewhere. "I think we use higher drug doses than anybody in the world except maybe the Russians," said Dr. Jonathon O. Cole of McLean Hospital in Belmont, Massachusetts. "We try to declare chemical warfare on psychosis."
>
> (Payer, 1988; p. 125)

Many new drug treatments have been extraordinarily successful at treating mental illnesses such as schizophrenia that are, in general, less responsive to

"talk therapies." However, the military metaphor puts an undue emphasis on aggressive, physical treatments for psychological problems in general. In the last twenty years, psychiatry as a whole has moved away from a preference for "talk therapy" (psychoanalysis and psychotherapy) towards drug therapies. Anatole Broyard, a cancer patient, discusses why his doctor's difficulties talking are problematic:

> Whether he wants to be or not, the doctor is a storyteller, and he can turn our lives into good or bad stories, regardless of the diagnosis...Perhaps later, when he is older, he'll have learned how to converse. Astute as he is, he doesn't yet understand that all cures are partly "talking cures." Every patient needs mouth-to-mouth resuscitation, for talk is the kiss of life.
>
> (Broyard, 1990)

Medical Training

Strategies for medical training are also affected by the war metaphor. The current emphasis on disease-based education is reinforced by war metaphor, in which disease is the enemy, while the patient is merely the battlefield. In war, soldiers fighting focus on the enemy; dealing with the destruction of the enemy becomes the educational priority. If doctors live by MEDICINE IS WAR, then a disease-centered education is appropriate, just as is the practice of medicine focused on the disease. The result, however, is poor educationally. Case-based learning presents information in the way doctors are actually given that information, from the point of view of the patient. Learning to deal with this information would be much more efficient than trying to convert that patient's information into a disease-based story.

As we have seen, medical education is structured like a bootcamp. This is simply another entailment of the MEDICINE IS WAR metaphor; if doctors are soldiers, then they should be trained like soldiers. Unfortunately, the final

result of this bootcamp is to change doctors.

> This transformation seemed closely related to the process we underwent in our studies: the games we played, the rituals we practiced, the patterns of interactions we learned, the values and expectations we acquired. In short, our transformation was part of a process of socialization. But this socialization transformed apparently nice people into *Doctors* who, frequently, were not nice at all.
>
> (Shapiro, 1987; p. 6)

One of the most significant problems with this professional transformation is that it turns those who want to give into those who want to take.

> The hard work and the concentration camp-like environment in the third and fourth years of medical school and residency give you the feeling that you are abused and that you are owed something.
>
> (Pekkanen, 1988; p. 156)

Ironically, the metaphor is self-defeating here. The war metaphor depends on a military picture of doctors who are willing to sacrifice themselves for the good of society, to fight disease at any cost. Yet the military training in the context of medicine can produce doctors who resent the whole system and want to take what they can get. Obviously, this is not conducive to the kind of health care most of us want.

Empowerment

The war metaphor de-emphasizes the individual's internal experience of disease in favor of a professional evaluation of whether someone "looks sick." Yet from within the frame of the patient, the perception is essentially somatic; we can easily get a *gestalt* of our own status as "sick" or not sick." In sickness, the body is perceived to be in an unusual state, unusual in a

negative sense (as opposed to the perception of an unusual positive state, such as a runner's high, sexual satisfaction, joy, etc.) Turning over assessment of one's own health to professionals is essentially an abrogation of individual power. In our society, the sick role can be a precious commodity.

First, being sick obviously entitles one to the benefits of medical care, and perhaps more importantly, medical research. The importance of this becomes apparent when one considers conditions which have been marginalized by medicine, such as mental handicaps, premenstrual syndrome, addiction, Alzheimer's disease, etc. If these conditions are considered to be in the provenance of medicine, the sufferers and their family will receive financial and emotional support from a number of areas. If not, they are left to struggle on their own. If the sick person is not the primary evaluator of sickness, then all of those who suffer from these marginalized conditions are left defenseless, at the mercy of others to identify them as sick or not. In this context, it is important to note that American insurance companies currently require a specific medical diagnosis before any payment is made to the individual.

Second, our cultural constructs concerning the rights of the ill allow a sick person to take time off, to rest, to recover, to skip work, school, or whatever commitments that person may have. Since our society has almost no other legitimate, socially-acceptable outlets for failure or inability to meet commitments, being sick can be a benefit. If identifying illness is something best done by doctors and others looking at another person, then the doctor is empowered at the expense of the individual.

Of course, being identified as sick also has negative connotations; many ill people have historically been ostracized from society - the mentally ill, lepers, plague victims, today's sufferers of AIDS. A medical and cultural perception that we can identify the sick from the outside can lead to societal policies highly damaging to ill individuals and even to those who are not ill or who are ill in different ways. Today's AIDS epidemic has led many people to believe that they can identify those who have AIDS by a stereotype; as a result, many people who do not in fact have AIDS are treated with suspicion and fear. Similarly, people with Lou Gehrig's disease appear to an uninformed observer to be mentally handicapped, but in fact have all their mental capacities.

We have seen that the MEDICINE IS A GROUND WAR metaphor, in essence, constructs a conceptual system in which medicine, not the individual, has the power to identify someone as sick or not sick. The result is that the individual's self-perception is devalued. Combined with the emphasis on surveillance entailed by the war metaphor, this de-emphasis of patient experience entails distrust of the individual who claims to be sick. The patient's story

> becomes the text that is to be decoded by the practitioner cum diagnostician. Practitioners, however, are not trained to be self-reflective interpreters of distinctive systems of meaning. They are turned out of medical schools as naive realists, like Dashiell Hammett's Sam Spade, who are led to believe that symptoms are clues to disease, evidence of a "natural" process, a physical entity to be discovered or uncovered...
>
> The upshot is that practitioners, trained to think of "real" disease entities, with natural histories and precise outcomes, find chronic illness messy and threatening. They have been taught to regard with suspicion patient's illness narratives and causal

> beliefs...The way of the specialist diagnostician, which is not to credit the patient's subjective account until it can be quantified and therefore rendered more "objective," can make a shambles of the care of the chronically ill.
>
> (Kleinman, 1988; p. 17)

In this context, let us now consider a 1984 finding "that the patient-physician interaction is organized as an interrogation." (Kleinman, p. 16) Doctors are suspicious of patients because their conceptual metaphors identify patients as potentially troublesome battlefields, if not potential enemies. This also explains the suspicious vocabulary used by doctors to re-tell the histories patients relate. "The patient *states* that she first experienced the pain ten years ago...the patient *denies* use of cigarettes...the patient *claims* her illness is caused by her stressful interactions at work..." Renee Anspach documents this in "The Language of Case Presentation":

> If physicians imbue the physical examination and diagnostic technology with unquestioned objectivity, they treat the patient's reports with an ethnomethodological skepticism—that is, as subjective accounts with only tenuous links to reality...
>
> Physicians "note," "observe," or "find"; patients "state," "report," "claim," "complain of," "admit," or "deny." The first verbs connote objective reality (i.e., only concrete entities can be noted or observed); the second verbs connote subjective perceptions...physicians are inclined to present information obtained from the physician as though it were factual, while treating information from the patients as accounts.
>
> (Anspach, 1990; pp. 330-331)

How can we have a caring doctor/patient relationship in an atmosphere of suspicion?

Perhaps the most important entailment of the MEDICINE IS WAR metaphor is that the primary fighters in the war against disease are doctors, not patients.

Doctors save lives; as a result, doctors become the heroes of medicine. Arthur Kleinman has commented on the importance of patient empowerment in medicine:

> What is clear is that chronic illness is an ongong process in which personal problems constantly emerge to challenge technical control, social order, and individual mastery. Like the rest of life, though greatly concentrated and intensified, it must be taken in total without valuing one part and rejecting others: we are both courageous and weak. Few of us are heroes in the grand sense; but in a small, quiet way and in a moral rather than a military sense, there are real heroes among the chronically ill.
> (Kleinman, 1988; pp. 144-5)

The current medical paradigm, based on the military metaphor, is incompatible with a view of patients as heroes. Yet this very vision may be necessary if medicine is to make the changes being demanded by society and by those within the profession itself.

Meaning

> Modern medical language admits disease to reality as a force that rends, shreds apart and decomposes the integrity of life.
> (Arney and Bergen, 1984; p. 22)

By casting illness as the enemy, the MEDICINE IS WAR metaphor highlights the negative experience of illness. One entailment of this is to put an increased emphasis on winning the war, getting it over with. Conceptualizing illness in this way denies any positive or enriching effects illnesses may have on individuals, their friends, their families, and doctors; it further discourages everyone involved in health-care from seeking larger meaning in the experience. Yet illness can, like any misfortune, become an important part of a life-story, an exemplary difficulty to be overcome and then smiled over. Illness can also have a larger meaning:

> The moral lesson illness teaches is that there are undesired and undeserved pains that must be lived through, that beneath the façade of bland optimism regarding the natural order of things, there is a deeper apprehension of a dark, hurtful stream of negative events and troubles. Change, caprice, and chaos, experienced in the body, challenge what order we are led to believe—need to believe—exists. Disability and death force us to reconsider our lives and our world. The possibility for human transformation, immanent or transcendent, sometimes begins with this disconcerting vision... For the seriously ill, insight can be the result of an often grim, though occasionally luminous, lived wisdom of the body in pain and the mind troubled. For family members and practitioners, moral insight can emerge from the felt experience of sympathy and empathy. It is this particular sense that I take to be the inner moral meaning of chronic illness and care.
>
> (Kleinman, 1988; p. 55)

The mapping of disease as the enemy diverts attention from this larger meaning, yet attention to and discussion of this meaning is an important and necessary part of human society:

> In these instances, the narrative may hold a moral purpose; it acts something like the recitation of myth in a ritual that reaffirms core cultural values under siege and reintegrates social relations whose structural tensions have been intensified. Illness narrative, again like the ritual use of myth, gives shape and finality to a loss.
>
> (Kleinman, 1988; p. 50)

CASE EXAMPLES

Can the MEDICINE IS A GROUND WAR metaphor affect the lives of individual doctors and patients? In order to answer this question, I will analyze two situations, each described by a doctor in *M.D.: Doctors Talk About Themselves;* one is a young resident in internal medicine, the other a senior surgeon.

Case 1

The success entailment of the war metaphor explains an unsettling series of remarks by one of the doctors in Pekkanen's book. The doctor is describing his feelings about an apparently healthy, seventeen- year-old patient with "a look of innocence on her face" (Pekkanen, ed., 1988; p. 29). She came into the emergency room in cardiac arrest.

> I was a young resident at the time. I thought I could easily save her because all we had to do was countershock her with defibrillation pads and her heart would respond and she would come right back. We countershocked her, and she didn't respond. We did it again and again, and she still didn't respond. We also gave her everything we could from the crash cart to get her heart started, the whole nine yards, but nothing happened. We worked on her for more than an hour and couldn't bring her back. She just died. The autopsy came back later. Nothing—no drugs, no sign of what went wrong. One of those things you can't explain.
>
> I felt incredible frustration at not having been able to do anything for her. She was a patient I had been so sure I could save, and when I couldn't, I just went off into a corner somewhere that afternoon and cried about it. She was the only patient I have ever cried over.
>
> I thought about her death for a long time. I still think about it. Bur I also realized there was a danger in feeling so strongly about

> patients, of becoming too emotionally involved in them. I realized that I had to hold something back, or every case was going to be a problem for me. I knew I couldn't continue this way, and as I grew older and more experienced, I realized that there are some patients who, for reasons you can't understand, don't make it, even though you think they should. It's something I have learned to accept, although it has been difficult.
>
> (Pekkanen, ed., 1988; p. 30)

This doctor believes that his tears and frustration over this patient were due to being "too emotionally involved" with her. However, I believe that his feelings are really due to an unconscious metaphor which equates failure as a doctor with not understanding and controlling disease. This doctor's relationship with the young girl is hardly one of emotional involvement; the patient is a girl he has never met before and about whom he knows absolutely nothing. Caring did not make this doctor cry; on the contrary, the main reason this doctor cried about this patient was pride. Young, apparently healthy, she was an ideal patient; "saving her" would win a young resident glory. Losing her with no explanation, however, was the ultimate defeat - complete failure to understand and control her disease.

This doctor uses this experience to segue into an argument that medical students need to be taught less, not more sensitivity.

> Don't teach the students sensitivity! For crying out loud, they have too much sensitivity for their patients as it is! Some of my students are barely able to function because they are so emotionally involved with patients They can hardly do the things that are necessary because they sit there and hold hands, and they get upset about everything. I have to teach most of my students how to keep their distance from patients, not become more sensitive to them.
>
> (Pekkanen, ed., 1988; p. 31)

This doctor's opinion is frightening to me, because his lack of awareness about the military metaphor for medicine is causing him to argue for a decrease in personal connections and caring in medicine. He confuses his feelings of frustration over a humiliating "defeat" with feelings of caring, and then decides that caring should thus be mandated out of health care.

Case 2

Another doctor describes a mistake in judgment that she made with a particular patient. The doctor had done a by-pass graft on the patient's leg earlier, because of circulatory obstruction. The patient came in with further problems in that leg; rather than amputate the leg as a preventive measure, the doctor chose to do a major surgical procedure on the patient. This resulted in the patient's death due to complications of the surgery.

> When you make a mistake like this, it just stays with you. I can now see that I had become too attached to the man's leg rather than to the patient. I was too protective of the earlier operations I had performed, and I wanted to make them work. It was a hard thing for me to quit on because of all I had invested in that leg.
> (Pekkanen, ed., 1988; p. 97)

This particular doctor is much more insightful than the last; in describing where she went wrong, she sees the problem as one in his conceptualization of the patient's situation, not in surgical technique or some other "medical" issue. She saw the patient as a leg with disease; the patient was merely the ground over which she battled with atherosclerosis.

One step further would be to realize that the reason the leg became so important was because of the military success/failure definition. She didn't want to give up, admit that she had lost to the disease, atherosclerosis.

Instead, she chooses to go on fighting by continued attacks on the battlefield of the leg. The surgeries are completed successfully, but they have complications on other organs - kidneys, heart, etc. In beating the disease on one front, the leg, the surgeon lost the patient's life. The doctor then goes on to state this herself:

> There is no question in my own mind that I should have quit when I could not find decent arterial outflow in the thigh area. Then the next morning when he was awake, I would have told him that *we had lost* and that we needed to do an amputation. He had a strong family and a lot of determination, and he would have done all right with the amputation. I think if I had done that, he would be alive today. The only thing positive to come out of something lke that is that it teaches you never to do it again.
>
> (Pekkanen, ed., 1988; p. 97 - my italics)

This doctor has come to an important and exemplary realization. She may not repeat his mistakes, but most doctors have not made conscious the war metaphor and its entailment for the patient.

CONCLUSION

Metaphor is not just a way of talking. A change in metaphor can change our entire conceptual system. Eisenberg points out the importance of conceptualization in medicine:

> My argument for the necessity of a more universal perspective on illness is not an academic exercise in the philosophy of medicine. What we think affects what we do. Biomedical concepts have yielded major dividends for certain classes of disease problems. However, they are not only irrelevant to others, but misleading because they misdirect our efforts. The image of the doctor as technician contributes to the paradox of patients being dissatisfied at a time when the profession considers that its powers are at their greatest.
>
> (Eisenberg, 1977; pp.9-23)

What we see in the world, what we judge to be important, how we act upon those perceptions - all of these are determined by our conceptual systems and thus affected by metaphor.

> The idea that metaphor is just a matter of language and can at best only describe reality stems from the view that what is real is wholly external to, and independent of, how human beings conceptualize the world—as if the study of reality were just the study of the physical world. Such a view of reality—so-called objective reality—leaves out human aspects of reality, in particular the real perceptions, conceptualizations, motivations, and actions that constitute most of what we experience. But the human aspects of reality are most of what matters to us...
>
> (Lakoff and Johnson, 1980; p. 146)

The human aspects of medicine are also what matter most in that field. Yet a gradual ideological shift, away from human connections and towards aggressive, technical interventions, is evident in the medical metaphors I

have discussed. The conceptual metaphors we have seen not only reflect problematic biases in medicine, but perpetuate these biases.

As we have seen, source domains of machines or war map the target domains of immunology or even surgery fairly well; however, the conceptual system reflected by these metaphors works very poorly when applied to medicine in general. In short, the relationship of technician to machine or military officer to battlefield is vitally different from the relationship of doctor to patient; the metaphors used by medicine minimize these vital differences and exaggerate potentially problematic similarities.

As I have described, the war and the repair business metaphors share several key entailments; each stresses prolonging biological life at any cost, and each values procedures over prevention. Most importantly, each metaphor presents a frame in which medicine is the central, active figure engaged with disease. In MEDICINE IS A REPAIR BUSINESS, the doctor has the technical skills to fix the medical problem; the patient is merely a non-experiencing machine to be fixed. In MEDICINE IS WAR, the doctor has the military strength to fight disease, while the patient is passive, the battlefield over which war is waged. By focusing on the interaction between disease and doctor, each of these medical metaphors loses the patient.

> Consider, for example, a study that shows that giving chemotherapy to elderly patients with cancer prolongs their lives by an average of a few months but also causes them severe, intractable, drug-induced vomiting. If one believes that length of life is the most important criterion, this study would indicate that such patients should be given chemotherapy; if one believes quality of life is more important it might indicate that chemotherapy should not be given.

> In fact, the American authors of this particular paper felt the added months justified a recommendation for chemotherapy; Englishmen who commented on it in the *British Medical Journal* felt this recommendation was off base. *In neither commentary did the authors recommend that patients be asked how they felt about the matter.*
> (Payer,1988; p. 31; my italics)

This passage illustrates the problem inherent in such a view of the patient's role and its importance in a medical setting; the metaphors I have discussed excommunicate the experiencing patient. A multitude of small details about hospital functioning send a similar message, supporting medicine's disavowal of human emotion around illness. Patients often complain that the aura of sterility in a hospital is disturbing; what troubles them is not the physical cleanliness itself, but rather the emotional sterility reflected and enforced by the physical sterility. The cleanliness, the muted colors, and the hush of the hospital cause patients to feel self-conscious about creating any "mess" or disruption. The lack of any private, intimate space also discourages emotion. No one has real privacy, even the rare patient with a "private" room; everyone hears everyone else's coughs, tears, and bathroom sounds.

Most medical workers would say that the gowns patients are forced to wear are necessary because they are easily washed and help maintain physical sterility. They also help discourage patients from disrupting the status quo. These gowns are uniformly poor-fitting, ugly, not warm enough, and tend to fly open in the back; some patient gowns today are even made out of paper. Just putting on this humiliating uniform creates feelings of helplessness, indirectly keeping patients in line and encouraging them to "lie still and take it."

The impotency of the patient's uniform is in sharp contrast to the empowering white coat in which doctors are outfitted. Patients quickly get the message that intimations of their experience of the medical procedures are not welcome; for example, they typically delay asking for pain reliever or for help going to the bathroom, because they are afraid to "bother" the nurses or doctors with their personal needs.

Strong feelings on the part of the care-givers are also discouraged by medicine. Medical students quickly learn that any disruption of the emotionless *status quo* is punished. We're not supposed to cry. Mistakes are only made by those outside the university hospital. We are not even supposed to say "I don't know." Of course, these attitudes are also linked with the metaphors I have discussed. If the medical system conceptualizes doctors as technicians or military personnel, then they will behave as such. Technical skills will be developed at the expense of learning interpersonal communication; the rigidity and callousness of the military will be necessary and enforced.

> The laboratory atmosphere can probably be traced back to the idea of asepsis, to the avoidance of contagion. Originally, the patient was protected by the sterility of the hospital. Only the sterility went too far: It sterilized the doctor's thinking. It sterilized the patient's entire experience in the hospital. It sterilized the very notion of illness to the point where we can't bring our soiled thoughts to bear on it. But the sick man needs the contagion of life.
>
> (Broyard, 1990)

The MEDICINE IS A GROUND WAR and MEDICINE IS A REPAIR BUSINESS metaphors are antithetical to a doctor/patient relationship based on shared human experience. The metaphors are also antithetical to the basic premise attracting many doctors to medicine in the first place. Most doctors

originally go into the field of medicine in order to help people, not to fight disease or become technicians. Yet somehow in the process of medical education, many doctors seem to have lost sight of this intended goal. As one second year medical student wrote,

> I guess the residents think we are too innocent, too vulnerable. They tell jokes, seem hardened, inured to misery and distress. I guess I'll be like that one day, and not so far away either, from what I hear. But if so, then I think I will have lost something important. Maybe because I've only been in med school for two years, I feel closer to patients. I mean I'm not that far away from being a layman. I guess you're not supposed to feel like that when you're a busy resident. It kind of frightens me. Do I want to be like them? I went into medicine to help sick people, not to put them down or avoid human issues.
>
> (Kleinman, 1988; p. 220)

The American medical system in the 1990s thus rests on an essential tension: the goal is to care for the patient, but the actuality of medical practice focuses on repairing what's broken and fighting disease."In medical school I quickly found out that caring was not part of the curiculum; indeed it was discouraged" (Harrison, 1982; p. 1).

In essence, the MEDICINE IS A REPAIR BUSINESS and the MEDICINE IS A GROUND WAR metaphors distance all concerned from emotion. Why is medicine so reluctant to deal with human emotions in the context of illness? Psychoanalyst Ellen Siegelmann has noted that conceptual metaphors often evolve from an unconscious fantasy (Siegelman, 1990). Its central metaphors suggest that medicine's unconscious fantasy is that death can be denied.

> The subjective experience of dying became a potential disruption to routines and procedures needed in the medical workplace. The medical workplace was devoted to prolonging life by keeping the history of disease for ending it. Death could not be admitted, even in name. (Arney and Bergen, 1984; p. 31)

The repair business metaphor for medicine creates a focus on prolonging life, fixing the body's parts indefinitely. The war metaphor focuses on fighting disease to stave off death. Both metaphors entail the value of life at almost any cost; death is medical failure. The conflict between the value placed on denying death by these conceptual metaphors and the value of allowing death to occur may also help explain why the topic of euthanasia has become the keystone of current medical ethics debate. As an intern says in *M.D.: Doctors Talk About Themselves*, "Death is always the enemy" (Pekkanen, ed., 1988; p. 191). Medicine has become an American fairy tale; the doctor saves the patient from death, and the only happy ending can be "...and they lived happily ever after."

Others have also noted the American medical emphasis on denying death. One British doctor compares medical attitudes in England with those in the United States:

> ...in the UK we strive less officiously to keep alive. This is not callousness but stems from a different attitude to death. American physicians seem to regard death as the ultimate failure of their skill. British doctors fequently regard death as physiological, sometimes even devoutly to be wished.
> (Hull, 1976; cited in Payer, 1988; p. 121)

Seeing death as a failure for medicine is also the topic of an essay in *JAMA* entitled "Not on My Shift." The author, Lynn Crosby, writes of a seriously ill patient who has just come out of surgery.

> It was a Saturday night, and I was getting a report from the surgical resident who had been on call the previous shift. "We had quite a time with your patient last night," he said. "She survived the operation, but I think she'll probably die sometime today."

"Not on my shift," I blurted out without thinking.

As I went through my surgical rotation in medical school, and now in residency, this situation had come up many times. There was always one patient on a service who was close to death. The residents did everything possible not to let the patient die on their night on call. It was inevitable that the patient would die, but to let that person die on your shift was a sign of failure.

...Finally, it was 7 AM, time for me to give the report to the next surgical resident. I described the evening's work with my patient and said that she was in serious condition, that I thought she would probably die during the day.

The oncoming surgical resident flashed back, "Not on my shift!"
(Crosby, in Dan and Young, eds., 1988; p. 38)

Medical vocabulary even denies death, preferring euphemisms like "the patient with end-stage renal disease" to "the dying man." Thus we avoid having to say a patient is dead or dying, which would invoke the doctor's failure.

The expressions used to denote a patient's death, or the fact that a patient is dying, obscure that important fact and thereby reinforce the notion of the physician's infallibility. A person who is dying is often said to have a condition that is *terminal*. In some hospitals, a patient near death is said to be *skating down the tube*. When death comes, a patient doesn't die but *expires*, or *arrests* (or does nothing at all while the physician *loses the patient*).
(Shapiro, 1987; p. 171)

The last term is particularly illustrative of the connection between metaphor and conceptual system. Understanding a patient's death in terms of the doctor "losing the patient" only makes sense in light of the conceptual system we have seen, in which the doctor, rather than the patient, is the active, central figure in health care. Even the patient's death does not make the patient's

experience central to medicine; the doctor is still the active agent, the one who "loses" the patient.

I believe that medicine is also "losing the patient" in a more important way; not through death itself, but through the *denial* of death and of human drama, the denials implicit in medicine's dominant metaphors and the conceptual system in which they work. In *The Plague*, Camus lays out the problem with the medical profession seeing its goal in this way. The hero, Dr. Bernard Rieux, is conversing with Jean Tarrou, a somewhat mysterious visitor to the town with a questioning, observant bent. Tarrou asks the doctor how he can work so hard in the midst of the plague, when he does not believe in God:

> His face still in shadow, Rieux said that he'd already answered: that if he believed in an all-powerful God he would cease curing the sick and leave that to Him. But no one in the world believed in a God of that sort...And this was proved by the fact that no one ever threw himself on Providence completely. Anyhow, in this respect Rieux believed himself to be on the right road—in fighting against creation as he found it.
>
> "Ah," Tarrou remarked. "So that's the idea you have of your profession?"
>
> "More or less." The doctor came back into the light..."Yes, you're thinking it calls for pride to feel that way. But I assure you I've no more than the pride that's needed to keep me going. I have no idea what's awaiting me, or what will happen when all this ends. For the moment I know this; there are sick people and they need curing...I defend them as best I can, that's all."
>
> "Against whom?"...
>
> "I haven't a notion, Tarrou; I assure you I haven't a notion. When I entered this profession, I did it 'abstractedly,' so to speak; because I had a desire for it, because it meant a career like another, one that young men often aspire to...Only, I've never managed to get used to seeing people die. That's all I know. Yet

after all—"...

"After all," the doctor repeated, then hesitated again, fixing his eyes on Tarrou, "...since the order of the world is shaped by death, mightn't it be better for God if we refuse to believe in Him and struggle with all our might against death, without raising our eyes toward the heaven where He sits in silence?"

Tarrou nodded.

"Yes. But your victories will never be lasting; that's all."

Rieux's face darkened.

"Yes, I know that. But it's no reason for giving up the struggle."

"No reason, I agree. Only, I now can picture what this plague must mean for you."

"Yes. A never ending defeat."
(Camus, 1947; p. 121)

This denial of death manifests itself in a denial of the patient's needs and feelings, the doctor's reaction to those emotions, and, essentially, a denial of human drama: "Physicians have been taught in medical school that they must keep the patient at a distance because there isn't time to accommodate his personality, or because if the doctor becomes "involved" in the patient's predicament, the emotional burden will be too great" (Broyard, 1990).

The medical world denies the existence of tragedy and comedy, of pain and uncertainty, of anger and joy, frustration and fear, all as part of the process of denying the existence of death. Medicine is like Victor Frankenstein, the doctor who creates a monster in his attempt to create beings who will never know pain or the agony of death. But what Dr. Frankenstein creates is a monster out of a nightmare, and what modern medicine creates is

experienced by many patients and physicians as a nightmare. I believe that acknowledging death and the drama implicit in medical practice is necessary for both doctors and patients.

> To help the doctor reach the patient, and the patient reach the doctor, the mood of the hospital might have to be modified. It might be less like a laboratory and more like a theater, which would be only fitting, since no place contains more drama.
> (Broyard, 1990)

Acknowledging the drama might actually make easier the process of dealing with our complex emotions around illness.

> As I've suggested, it doesn't take much time to make good contact, but beyond that, the emotional burden of avoiding the patient may be much harder on the doctor than he imagines. It may be that sometimes makes him complain of feeling harassed. The patient's unanswered questions will always thunder in his stethoscope. A doctor's job would be so much more interesting and satisfying if he would occasionally let himself plunge into the patient, if he could lose his own fear of falling.
> (Broyard, 1990)

In *The Illness Narratives*, Kleinman calls for "a transformation in the way we think of medicine" (Kleinman, 1988; p. 259), and he describes some of the difficulties involved in achieving such a paradigmatic change.

> ...given the limited resources and conflicting claims on those resources of a practical world, it will take pressure from both outside and within medicine to bring about such a change. Until the academic discourse of medicine is expanded beyond the languages of molecules and drugs to include the language of experience and meanings, however, medical science will reinforce the profession's resistance to the problems of illness rather than contribute to the broadening of its vision.
> (Kleinman, 1988; p. 266)

Cognitive linguistic evidence suggests that medicine still *thinks* in a problematic way; the metaphors we have seen structure the way doctors act,

talk, and think about themselves in day-to-day life. Externally imposed new models can only change medicine very slowly as long as medical students are still learning to think about their jobs in terms of a repair business and doctors are still waging a war against disease. A significant transformation of American medicine *is impossible* as long as medicine continues to live by the unconscious metaphors I have discussed. Awareness of these metaphors, however, allows us to reapproach the drama inherent in medicine, and to make judicious choices about the future of medical care. Achieving a consciousness and an understanding of the conceptual system structured by metaphor thus represents an important step in healing the medical system itself.

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FIGURE 1

Ceclor® (cefaclor): The respiratory tract under fire

FIGURE 2

Procardia XL® (nifedipine): A victory in angina

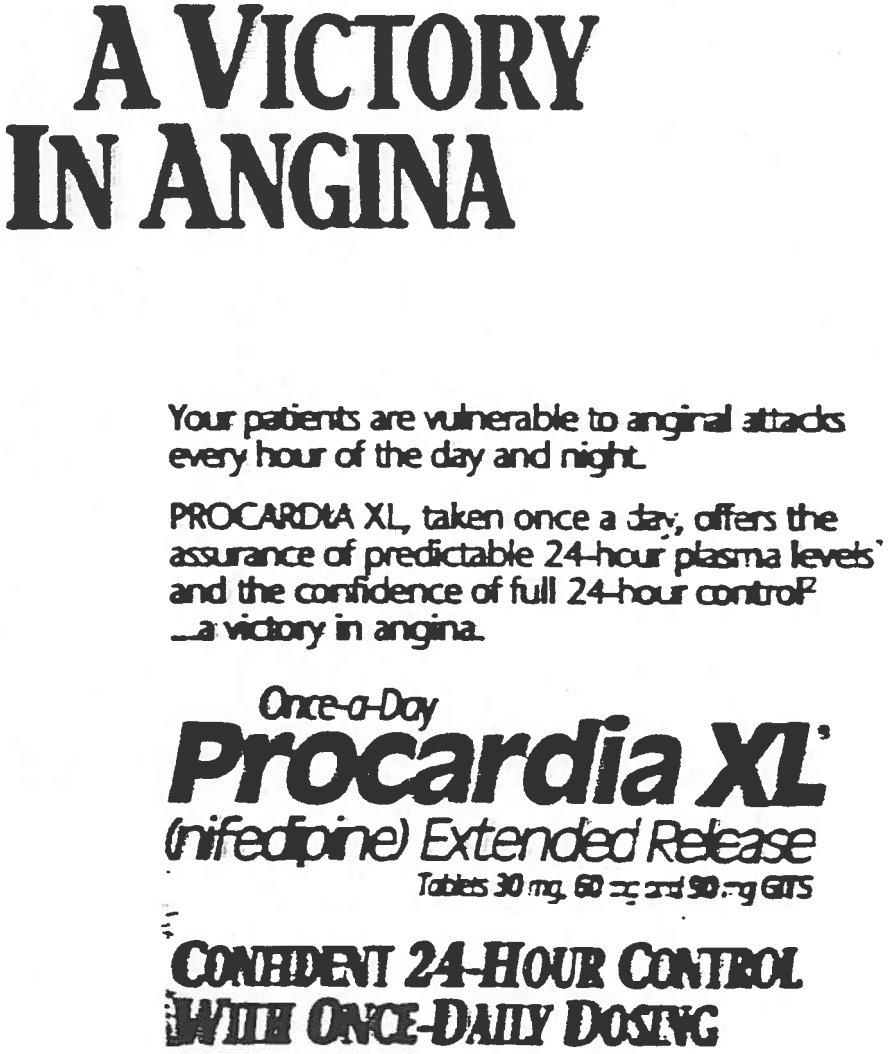

FIGURE 3

Librax® (chlordiazepoxide): It's time for the peacemaker