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THE SORE THAT DOES NOT HEAL: CAUSE AND CONCEPT IN THE NAVAJO EXPERIENCE OF CANCER

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In comparison with biomedicine, Navajo traditional medicine has been characterized as having far less elaboration of specific disease categories and of specific causal attributions of illness. The Navajo experience with cancer provides an occasion to examine how a biomedical category and the attendant elements of causal reasoning are taken up and transformed in the Navajo system. The nature of Navajo causal reasoning about cancer is analyzed through comparison of data from Navajo and Anglo-American cancer patients. The problem of specificity in cause and concept is addressed with reference to Navajos' common attribution of cancer to exposure to lightning. Methodological issues in this area of cultural analysis are summarized in terms of conceptual distinctions between cause and symptom, between disease as entity or as process, between biomedical and traditional ethnomedical systems, and between body and mind.

THE PROBLEM OF CAUSAL reasoning about illness is one of the enduring questions of anthropology, attracting perennial interest ever since the time of Tylor (Zempléni 1985). The Navajo ethnomedical system, one of the most extensively studied, is known to be particularly concerned with the determination and elimination of causes of illness. Two features of the Navajo literature are of relevance for the present argument. First, within the Navajo system anthropologists have identified etiological processes such as witchcraft, spiritual contagion, encounters with ghosts, and violation of taboo and, in practice, have classified Navajo healing ceremonies by the pathogenic agents they are intended to eliminate. However, not much attention has ever been paid to how these pathogenic agents are said to operate on or within people. Second, it is understood that Navajo ethnomedicine does not have a highly elaborated classification of diseases that can be matched with these general causal processes (Werner 1965); in principle, any cause can bring about any disease. Rarely has it been acknowledged that particular causes may be associated with particular symptoms or has a particular disorder been identified and analyzed (Levy, Neutra, and Parker 1987). Thus, the analysis of causal reasoning tends to stop with identifying causes and does not go on to a more complete account of cause and effect.¹

In contrast to the Navajo medical system's focus on identification and removal of the *causes* of illness, the Anglo-American biomedical system is understood to be more concerned with the nature, classification, and removal of particular *diseases*. The disease in biomedicine is a quite specific entity that can be treated as a thing in itself, and even if it is the kind of disease that can be cured simply by removing its cause, the cause itself is a specific entity rather than a generalized process. It is easy from this point of view to draw the conclusion that

our system is characterized by specificity, while systems such as that of the Navajo are nonspecific. The implication is either that biomedicine is thus superior by virtue of its precision or that we can easily understand nonspecific systems because they obviously heal through nonspecific mechanisms like the placebo effect or catharsis.

The question that remains unasked is whether medical systems other than biomedicine exhibit different kinds of specificity in their reasoning about cause and effect. This question is complicated by recent studies suggesting that systems of causes (etiologies) and systems of diseases (nosologies) are not as distinct as one might wish for analytic purposes. It has been reported among the African Evuzok (Guimera 1978) and the Iranians (Good and Good 1982) that disease classifications may simultaneously include categories that refer to cause and that describe symptom patterns. If we have in the past mistaken etiological categories for descriptive names of illnesses, we may also have made the error of missing the descriptive elements in what are thought to be purely etiological categories.

In this paper I propose that the analysis of specificity of cause and effect be grounded in the concrete bodily processes said to be initiated by (often abstract) causal agents and said to characterize (equally abstract) diseases.² I focus on cancer, a disease for which the causes are uncertain and the manifestations are multiple, and examine how it has been incorporated into the medical reasoning of contemporary Navajos. Next I examine Navajo causal reasoning about cancer, based on how Navajo patients who have themselves experienced episodes of the disease construe the circumstances, and compare my findings with equivalent data from Anglo-American cancer patients. Focusing on lightning, the most frequent and most culturally distinct cause cited by Navajo patients, I then discuss the nature of the cause and effect relationship between lightning and cancer. Following a brief summary of the problem of specificity in these three areas—defining a disease category, causal attribution, and cause and effect—I conclude with a discussion of four pragmatic and methodological issues raised by the problem of causal reasoning about illness. These issues are defined in terms of conceptual distinctions between cause and symptom, between disease as entity or as process, between biomedical and traditional ethnomedical systems, and between body and mind.

CANCER AMONG NAVAJOS AND ANGLO-AMERICANS

The Navajo are the largest of Native North American groups, with an on-reservation population estimated at 150,000 and as many as an additional 30,000 living away from the homeland. The reservation itself is the largest in North America, with an area typically described as equivalent to the state of West Virginia or to New England excluding Maine. The traditional medical system is a fee for service system that includes diagnosticians, herbalists, midwives, and medicine men who perform the major curing ceremonies. Under treaty obligations originating in 1868, biomedical health care is provided free of charge

at federal government hospitals and clinics operated by the Navajo Area Indian Health Service (IHS) and at several small private hospitals.

Incidence rates of cancer among Native Americans remain typically lower than in the general population of the United States. In 1978–81, incidence of malignant cases in all anatomical sites per 100,000 in the general U.S. population was 337.9. For the same period in the state of New Mexico (home to a substantial proportion of the Navajo population), incidence was a lower 285.2, but among Native Americans in New Mexico (including other groups as well as Navajos), incidence was only 164.2 (Horm et al. 1984).

In addition to this quantitative difference in total incidence, rates of different types of cancer vary between Navajos and the general population of the United States. Indian Health Service physicians typically mention relatively higher rates for Navajos of gastrointestinal cancers (stomach, colon, rectum), urological cancers (bladder and kidney), and cervical cancer, along with much lower rates of lung cancer (cf. Kunitz and Levy 1981:353). The higher rates of some cancers have been attributed to dietary factors or the presence of carcinogenic trace elements in the environment; the lower rate of lung cancer (except among uranium miners) is attributed to the virtual absence of cigarette smoking among Navajos. The relative *prevalence* of different cancers among Navajos is depicted in Table 1, based on figures for the Navajo Reservation provided by the New Mexico Tumor Registry. Assuming a denominator of 150,000, the overall prevalence of cancer would be 0.63 percent among Navajos.³

According to figures cited by Kunitz (1983:67), hospital discharge rates for malignant neoplasms in 1972 were 23.3 per 10,000 for Navajos, while they were 102.8 per 10,000 for the United States as a whole and 97.0 per 10,000 for the western United States. Reported mortality rates per 100,000 for Navajos were 24–27 in 1954–56, 46–48 in 1965–67, and 35–41 in 1973–75, while for the general United States population the mortality rate in 1976 was 132.3 per 100,000; the percentage of total mortality from malignant neoplasms in the mid-1970s was only 5.8 percent for Navajos, while it was 21 percent for the general United States population (Kunitz 1983:65).

In spite of the lower overall cancer rates for Navajos as compared with the general United States population, the preceding discussion indicates a steady increase over the course of the century. This can be understood in terms of the theory of epidemiological transition, which suggests that “developing societies,” among which Navajo society can in some respects be included, exhibit a shift from the prominence of infectious and parasitic diseases to chronic degenerative and man-made diseases (Broudy and May 1983). A somewhat simpler explanation is the survival of more older Navajos with chronic disabilities, survival brought about by the gradual improvement in medical care that has eliminated earlier causes of mortality such as tuberculosis (Kunitz and Levy 1981). For present purposes it will suffice to say that, although cancer is by no means among the leading causes of Navajo mortality, the gradual increase in cancer incidence has not gone unnoticed among Navajos and hence is an increasing source of concern.

TABLE 1
Proportion of Cancer Diagnoses by Anatomical Site for Navajo Patients:
June 1986

Primary Cancer Site	Percentage	Number of Cases
Eye	1	5
Mouth	1	9
Throat/nose	0	4
Brain	1	6
Thyroid/pituitary	5	50
Other unspecified parts of nervous system	0	2
Stomach	1	12
Colon/rectum	4	38
Liver/pancreas	1	8
Gallbladder	1	10
Kidney	2	20
Urinary bladder	0	4
Bronchus/lung	1	5
Sinus/larynx	0	3
Blood	2	15
Lymph nodes	1	7
Bone/joints/cartilage	1	9
Connective, subcutaneous, and other soft tissue	2	17
Skin	1	8
Breast (female)	6	55
Cervix	47	447
Placenta/ovary/vagina/ vulva	17	157
Prostate/testicles	5	48
Special ^a	1	5
Unknown primary site	1	5
Total	102 ^b	949

Source: Based on data provided by the New Mexico Tumor Registry for all IHS Service Units of the Navajo Reservation.

- a. Overlapping sites in nasopharynx (1 case), in pancreas (1 case), in urinary bladder (3 cases).
 b. Over 100 percent due to rounding off.

The Navajo portion of this study was carried out among cancer patients who had utilized two Public Health Service hospitals on the Navajo Reservation, those at Fort Defiance and Tuba City (Figure 1). These two hospitals are located in distinct regions of Navajoland, and the patients they serve thus represent a range of internal diversity within Navajo society. The Fort Defiance cachement area is more densely populated and has more forest and grassland

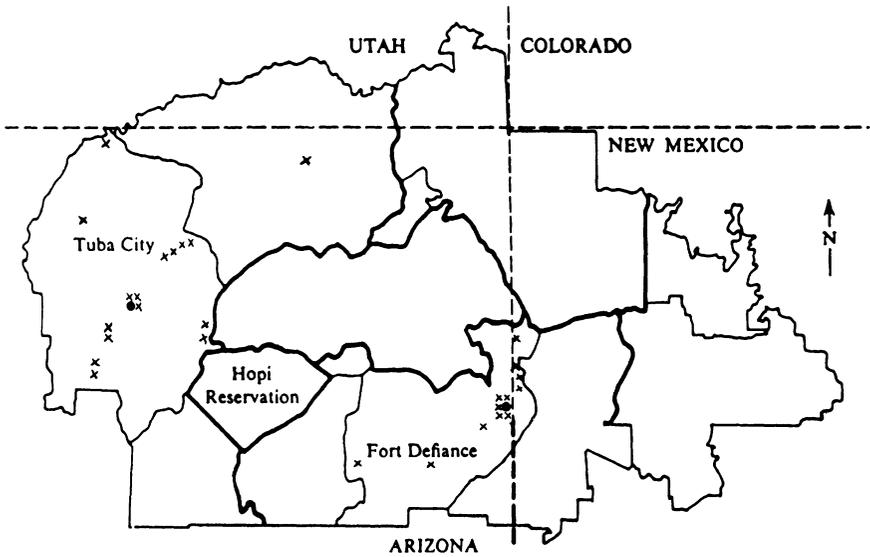


Figure 1. Approximate Homesites of Patients Interviewed

X = homesite

areas; its residents are more familiar with Anglo-American society. In contrast, the arid western area around Tuba City is more sparsely populated, and its inhabitants are more accustomed to a traditional Navajo life-style. The more traditional orientation of the west is borne out insofar as a greater proportion of Tuba City patients spoke the Navajo language, adhered to Navajo religion, and had less formal education (Table 2). In addition to gathering patient data, I also conducted interviews on more specialized traditional knowledge about cancer with four bicultural medicine men who also work as teachers in the public education system.

The Boston portion of the study was carried out among patients in radiation therapy at the Massachusetts General Hospital.⁴ The fifty-five patients were predominantly Euro-American; ten were American blacks, and two were Haitian blacks. Demographics of the comparison groups (Table 2) indicate expected differences in level of education, with the Boston group considerably more educated, and in religious adherence, especially with regard to the number in the Boston group indicating no adherence. The distribution of cancer types (Table 3) conforms to the expected difference between Navajo and Anglo, with the former showing relatively more disease of the digestive and female reproductive tracts and an absence of lung cancer. This difference suggests that, in general, the comparison groups are diagnostically representative of their respective populations, in spite of the relatively small size of the groups by epidemiological standards.⁵

TABLE 2
Summary of Patient Characteristics

Demographic Data	Fort Defiance <i>N</i> = 12	Tuba City <i>N</i> = 16	Boston <i>N</i> = 55
Male	6	7	25
Female	6	9	30
Age range	19-86	27-82	19-78
Language of interview			
Navajo	4	12	0
English	8	4	55
Marital status			
Married	6	11	32
Widowed	2	1	5
Divorced/separated	2	1	4
Single	2	3	14
Education			
Graduate degree	0	0	3
College	2	0	16
High school	5	3	20
Less than high school	2	3	9
None	3	10	(missing) 7
Religion			
Navajo	3	8	0
Native American Church	1	4	0
Catholic	3	0	18
Protestant	4	4	13
Mormon	1	0	0
Jewish	0	0	6
Greek Orthodox	0	0	1
None or missing	0	0	17

NAVAJO CONCEPTIONS OF CANCER

It is not certain when the Anglo-American concept of "cancer" as a disease became widely known among Navajos. A survey of 4,826 Navajo admissions to Sage Memorial Hospital in the 1930s reported only three cases of cervical carcinoma in elderly women and one case of sarcoma, accounting for only 0.08 percent of hospital admissions (Salisbury 1937). Reichard (1950:97) cites two cases, probably from the 1940s, one of breast cancer and one of a man diagnosed with terminal cancer of the rectum who was healed by a traditional

TABLE 3
Summary of Cancer Types

Type of Cancer	Fort Defiance N = 12	Tuba City N = 16	Boston N = 55
Endometrial	1	0	0
Cervical	1	1	0
Ovarian	1	0	0
Breast	3	4	19
Testicular/prostate	2	1	5
Stomach	2	0	2
Colon/rectal	0	2	6
Liver/gallbladder/pancreatic	0	0	3
Kidney/bladder	0	4	3
Thyroid	0	1	0
Lymphoma	1	2	1
Brain/central nervous system	1	0	2
Leukemia	0	1	0
Lung	0	0	8
Bone/soft tissue	0	0	4
Unknown	0	0	2

medicine man. In the 1960s a widely publicized outbreak of lung cancer occurred among Navajo uranium miners (Gottlieb and Husen 1982). This event very likely did much to disseminate the English term "cancer" among Navajos. In the 1970s personnel of the Navajo Area Indian Health Service, in collaboration with traditional medicine men, began a Cancer Control Project designed to increase cooperation between the two health systems. A major goal was to convince medicine men to refer cancer patients for simultaneous medical treatment rather than waiting to see if a traditional ceremony was effective.

Requisite to the validity of cross-cultural comparison is determination of whether an indigenous concept exists parallel to that of cancer as a discrete type of illness. To be sure, although oncologists technically regard each cancer as a separate disease, American popular culture recognizes cancer as a global entity. Aside from contact with cosmopolitan biomedicine, there is no immediate necessity for an indigenous nosological system to classify cancers that affect different parts of the body with different symptomatic manifestations as belonging to the same nosological category. In addition, it is relevant to recall Werner's (1965) observation that the Navajo language has never had a large list of named diseases, but rather a series of connotatively overlapping ways of referring to and describing sickness and pain. Thus, neither is there an immediate necessity that cancer be distinguished as a discrete disease entity in the first place.

The bicultural medicine men consulted placed the origin of cancer, along with other diseases, in the second mythic creation, the yellow world. One

dimension of this origin is in sexual abuses committed by the yellow world's inhabitants, such as incest, homosexuality, and transsexuality, and in this way cancer is linked to the venereal diseases. A second dimension is the inhabitants' misguided attempt to control nature and their consequent misuse of natural forces such as radiation and electricity, and in this way Navajos understand why hospitals treat cancer with radiation and dangerous chemicals. At the same time, one medicine man speculated that the most common contemporary Navajo terms for cancer are probably of recent origin ("I don't know, I wasn't at the meeting where those words were decided on"), perhaps coined by people translating for doctors.

In fact, there are two principal Navajo language terms that denote cancer. Both *łóód doo nádzihi* (sore that does not heal) and *nááldzid* (keeps on rotting) are in common use by patients and Navajo health care professionals alike. The Young and Morgan (1987) dictionary gives "rotten, gangrene, and cancer" as equivalent translations of the word "nááldzid" and for cancer further specifies *nááldzid k'ee'qá nooséekii* (the rottenness that spreads as it grows). One medicine man stated that *nááldzid* was the only correct Navajo term for cancer, while *łóód doo nádzihi* was a generalized term that could mean any kind of nonhealing sore. Another recognized both names but distinguished them as two types of disease.

In her medical lexicon, Austin (n.d.) includes the term *łóódtsoh* (big sore) as a translation of cancer, while Young and Morgan (1987) use the same term to denote smallpox. The term *łóód ná'agháazhi* (sore that eats you inside) was cited by a Navajo health care professional and by one medicine man as referring to cancer. Young and Morgan (1987) again disagree, translating this term as ulcer. *Łóód doo yi'íinii* (sore you can't see) was also cited by a medicine man. In the term *nákid doo yi'íinii*, the word "nákid" refers to small worms or bugs of sexually transmitted diseases, which create sores and cause rotting regarded as related to cancer. However, none of these terms appears to be common in popular or current professional usage.

Whatever the correct relation among the terms, as a type of disease in the Navajo system, cancer has tended to become a composite etiological category, rather than a purely descriptive one (Good and Good 1982). Although Navajos recognize that cancer can occur in different parts of the body and may affect different parts in men and women, this is not precisely how they would understand the phrase "different cancers." Instead this phrase was described as a composite term in an etiological sense: cancer "caused by snakes, by tornados, or by [sexually transmitted] bugs [germs] all combined together is called *nááldzid*."

It is evident, however, that the Navajo terms conceptualize cancer as a sore more than as a growth or tumor. Indeed, another medicine man, speaking in English, indicated a similarity between cancer and boils. Neologisms for tumor exist only in the technical vocabulary prepared by Austin (*doo ákól'éégóó dín-íséehgo*, "mass") and the dictionary of Young and Morgan (*'atsi' bi' n'íłts'id*, "compact mass within flesh"). This fundamental difference between Navajo and

Anglo conceptions might be attributable to more than one source. An external sore is immediately apprehensible as a visible process. Likewise, rotting is a visible process quite familiar to people living in proximity to both domesticated and undomesticated animals, a process which furthermore could easily be extrapolated to the notion of decay as an internal, invisible process. Yet visibility and familiarity alone are inadequate to account for the difference between Navajo and Anglo conceptions, since many tumors can be palpated and since animal butchery could produce knowledge of pathological internal growths. I would suggest, instead, that negative, uncontrolled growth is a less culturally salient metaphor for Navajos than for ourselves. In Navajo thought, growth is inherently positive, whereas degeneration and decay are characteristically negative processes. The traditional Navajo conception of the life cycle is one of rising energy and achievement until age fifty and progressive decline and decay until death at age one hundred. To conceive of cancer as something that "keeps on rotting" is more consistent with such a view, while our own conceptualization of "unchecked growth" is consistent with our fear of nature (and society) out of control. Even the one Navajo patient who used the word "tumor," when questioned about her perception of how the disease worked in her body (pathophysiology), responded that it was probably "eating me inside."

The broader implication of this argument is for the role of metaphor in the relation between culture and illness. Not only can illnesses be used as metaphors of society and social process, as has been argued by Sontag (1978) and others, but the very features and processes that are attributed to illnesses and then projected onto social situations are themselves formulated in terms of dominant cultural metaphors (Lakoff and Johnson 1980). This is not the same as saying, for example, that our perception of tuberculosis is changed by its no longer being associated with hectic passion and creativity. We can still conceive of tuberculosis as a kind of "consumptive" process even if we no longer give the same connotation to consumption. Instead, if a disease is an apt metaphor for certain social processes, it is only because its pathophysiology has already been cast in metaphors generated in the process of social life, metaphors that may not suggest themselves in another society. Thus the metaphorical relation between cultures and illnesses must be understood as reciprocal.

To return to the more immediate question, however, we must determine whether the indigenous Navajo conception admits the possibility that cancer is curable or is invariably fatal. These questions are bound up with the issue, often raised by reservation health care professionals, of whether Navajos tend toward "denial" of serious illness like cancer. In developing the interview, several Navajo consultants advised against direct reference to possible death and specific mention of the term "cancer," since to do so would appear to patients as an invocation of death and disease. In fact, few patients hesitated to name their illness when asked what it was, though only one patient referred explicitly to the imminence of death. Only one patient, who had consented to a hysterectomy in treatment of uterine cancer only after pain and bleeding

became severe, exhibited a degree of overt denial, and even she acknowledged that her illness “would have become cancer” if she had not undergone surgery.

To us, the notion of denial implies above all an inadequate process of coping with impending death. Avoiding thoughts about and reference to death may appear rather different from a Navajo perspective. When asked how the illness affected their thoughts, it was common for Navajo patients to insist that they thought only of becoming well, with an overtone that to capitulate to the inevitability of death was a morally inappropriate stance. In a similar vein, one Navajo health educator expressed admiration for an uncle who had died of cancer precisely because the uncle “never gave up hope” up to the moment of his passing. This attitude suggests that it would in some sense be incorrect to acknowledge any disease as necessarily fatal, even if such fears are implicit.

The issue of curability is more complex. Of the four Navajo cancer patients who could not specify the name of their illness, one referred to it as *doo bi'déébníini* (that which is not curable), while another emphasized that her illness could not have been “the sore that does not heal” (*łóód doo nádzihi*), since she was now cured. More indirect evidence comes from responses to the question of how traditional healing ceremonies and herbal remedies may have helped. Only two patients claimed to have been definitively cured, one by traditional herbs and one by peyote. Several others stated that the evidence of ceremonial efficacy was to be found not in their cure, but in the brute fact that they were still alive. Though by no means definitive, these statements allude at once both to a liberal criterion of efficacy and to recognition of the possibility of imminent death, while leaving open the question of curability.

In the specialized perspective of bicultural medicine men, the disease is curable. One medicine man who distinguished *nááłdzid* and *łóód doo nádzihi* as two types of disease stated that each has a distinct herbal cure. *Nááłdzid* is cured by *azee' hááłdzid*, literally “medicine for rotting,” which itself is said to have a pungent smell like something that has spoiled. *Łóód doo nádzihi* is cured by *his yiyáqni*, “that which eats or dries up pus.” Several cancer patients did report having been treated with the latter remedy, although it appears to be used more broadly in treating infections and for patients who have undergone surgery. Adherents of the Native American Church claim that peyote can cure cancer, and narratives of such cures resemble Christian healing testimonies. Finally, one medicine man cited a traditional cure for cancer, known to Hopi, Zuni, Laguna, and Ute peoples but largely “forgotten” by Navajos, in which a dog is ceremonially killed and medicine prepared from its fat.

A more general statement comes from a medicine man informant of Adair's, who cited three ad hoc categories of curability: (1) diseases, like tuberculosis, that the medicine men have given up on and left to white doctors, i.e., intractable contagious diseases; (2) sickness caused by getting close to where lightning has struck, which medicine men can cure; and (3) illnesses, like snakebite poisoning, that both medicine men and white doctors can cure (Adair, Deutschle, and McDermott 1957). Combined with the statement reported

above that cancer originates in part from the abuse of radiant energy by inhabitants of a previous mythic world, this statement prefigures what will become my principal ethnographic question, the role of lightning in traditional Navajo causal reasoning about cancer.

In sum, cancer is understood to have a mythic origin along with other diseases, although the terms that denote it are of contemporary origin. The Navajo concept of cancer is distinctive in that it defines the processual feature of the disease not in the idiom of growth but in the idiom of rotting, such that cancer is understood as part of a larger class of "sores that do not heal" and "keep on rotting." At the same time, relative to its use in biomedicine, "cancer" appears to have become transformed from a purely descriptive to a composite etiological category as it has been incorporated into the contemporary Navajo medical system. Although acknowledged to be sometimes fatal, cancer may also be cured. To go further toward understanding the cultural and existential meaning of cancer in the Navajo experience, however, we must examine Navajo causal reasoning about the disease.

CAUSAL CONSTRUAL OF CANCER

Traditional Navajo theories of disease etiology were summarized by Wyman and Kluckhohn (1938) under the concept of "infection," although a more appropriate contemporary concept appears to be "contamination." In Wyman and Kluckhohn's formulation (1938:13–15), disease could result from exposure to animals, natural phenomena, ceremonials, evil spirits, and enemies or aliens, with witchcraft as an additional source of illness. Kunitz and Levy (1981:356–60) take a somewhat different approach, distinguishing etiological processes from agents and including other processes in addition to infection. Thus illness may result from soul loss, intrusion into a person of alien objects or spirits, violation of ritual restrictions, and witchcraft. Any of these processes may occur by means of specific agents including dangerous animals, natural phenomena such as lightning, exposure to powerful ceremonials that are incorrectly performed or are conducted when a participant is in a weakened condition, and evil spirits or ghosts. Reichard's earlier account (1950:80–82) elaborates this understanding by including the influence of completely buried monsters of the mythic age and the malevolence of undependable deities and by noting the role of human frailties such as ignorance of proper behavior, dangerously weakened conditions or states, and, especially, excess in any activity. Luckert (1975:151–62) proposes a typology of Navajo theories of disease and healing based less on etiology and more on a kind of pathophysiology grounded in an ethnopsychology of the person, including transformation and retransformation, fragmentation and reassemblage, submergence and reemergence, infection and catharsis, and separation and unification.

My findings on Navajo explanations of the causes of cancer (Table 4) must be understood against the background of this diversity of causes and effects

TABLE 4
Causal Construal of Cancer among Navajo Patients

Cause	Informant																												Cumulative total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
Injury	X	X	X	-	X	-	-	-	X	-	X	X	-	X	X	X	X	X	X	X	X	-	X	X	X	-	-	-	-
Lightning	X	X	X	-	-	X	-	-	X	-	-	X	-	-	-	-	-	-	-	X	-	-	X	X	X	-	-	X	-
Witchcraft	-	X	X	-	X	-	-	X	-	-	X	-	-	-	-	-	-	-	X	-	-	-	X	-	X	X	-	-	-
Exertion	-	X	-	-	-	-	X	X	X	-	X	X	-	-	-	-	-	-	-	-	X	-	-	-	X	-	-	X	-
Diet	-	-	X	-	-	X	-	-	X	-	X	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-
Animal violation	-	-	-	-	X	X	-	-	-	-	X	-	-	-	X	-	-	-	X	-	-	-	-	-	-	-	-	-	-
Environment	-	-	X	-	X	-	-	-	-	-	-	X	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-
Medication	X	-	X	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heredity	X	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-
Alcohol	-	X	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stress	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Illness	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Old age	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-
Ceremony	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Don't know	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-
Personal total of causes	4	5	6	0	4	4	0	2	1	4	2	5	2	2	2	0	1	1	4	3	2	1	5	2	2	3	1	1	1

elaborated within the traditional system. At the same time, the possible role of naturalistic or nonritual causes not included in ethnographic accounts must be entertained, as well as the interaction between Navajo etiologies and those of biomedicine and the popular medical culture of contemporary North America. Injury, the leading cause cited, creates an immediate problem in this respect, since Navajos traditionally distinguish between being "hurt" and "sick," and a distinct category of Navajo ceremonies (Lifeway) is directed toward injuries (Wyman and Kluckhohn 1938). Nonetheless, the idea that an injury can "turn into cancer" appears to be compatible with the awareness that such an injury may not heal properly, i.e., could become a sore that does not heal or keeps on rotting. Lightning, to which I shall return below, witchcraft, and animal violation conform to the traditional pattern of infection by powerful and dangerous forces. Exertion is understandable as a cause of cancer in terms of both the traditional concept of vulnerability in a weakened state and the traditional understanding that old age and death are the result of a gradual wearing down and depletion. Diet, environment, and medication, on the other hand, are typically associated with contemporary conditions of change in traditional life, respectively referring to increasing consumption of junk foods and foods with additives, environmental pollution, and adverse side effects of biomedical treatment. Heredity is a special case here, since two of the three Navajo patients who cited it came from an extended family in which there was a documented presence of a rare genetically based colon cancer. Alcohol consumption, stress, illness, and old age were cited rarely, and the one case of ceremonial contamination was reported by the only medicine man among our patient informants, who stated that the onset of his lymphoma occurred shortly after he performed a ceremony for a woman with a sore throat.

These Navajo data are placed in cross-cultural perspective by the comparative data presented in Table 5. For the Anglo-American data it was possible to distinguish answers to the questions of what patients believed "caused" their disease and what other factors they thought were "related" to their disease, whereas linguistic and conceptual difficulties made such an analysis impossible for the Navajo data. Thus, for Anglo-American patients, the most frequently cited cause was heredity, while the most frequently cited related factor was stress. When "causes" and "related factors" are collapsed into a single category, the ten leading elements of causal construal cited by Anglo-American patients were stress, heredity, injury, smoking, alcohol, diet, medication, illness, X rays, and life-style, in that order. Only five of these leading elements also appeared among the ten causes of cancer most frequently cited by Navajos, and they appeared in a quite different order of priority. Caution must be taken in interpreting these differences, however, as is evident by contrasting our results with those of Linn, Linn, and Stein (1982) on etiological beliefs among Anglo-American cancer patients. In that study heredity and stress were both cited but ranked fourth and seventh, respectively. The three leading elements were smoking, God's will, and type of work (in contrast to the leading elements of stress, heredity, and injury in the present study), and only six of the ten leading elements were also cited by my Anglo-American consultants.

TABLE 5
Comparison of Navajo and Anglo Causal Construal of Cancer

Cause	Navajo <i>N</i> = 28	Anglo "Related" <i>N</i> = 50	Anglo "Caused" <i>N</i> = 49
Injury	15	5	4
Lightning	11	0	0
Witchcraft	9	0	0
Exertion	7	0	0
Diet	5	3	2
Animal violation	5	0	0
Environment	4	1	1
Medication	3	5	0
Heredity	3	0	14
Alcohol	2	5	2
Stress	1	13	4
Illness	1	1	4
Old age	1	0	0
Ceremony	1	0	0
Weight	0	1	0
Psychological distress	0	2	0
Life-style	0	3	0
Smoking	0	5	3
X rays	0	2	1
Contagion	0	1	0
Breast implant	0	1	0
Bad luck	0	0	2
Total	68	48	37

Note: The *Ns* of 50 and 49 for Anglos exclude patients for whom data on causal construal were missing.

Nevertheless, it remains significant that Navajos cited lightning exposure, witchcraft, exertion, old age, animal violation, and ceremonial contamination as causes of cancer—causes that not only were absent from the Anglo-American data but also for the most part were prominent in the Navajo data. The principal overlap that requires interpretation in the causal construals of the two groups is injury. A tentative hypothesis is that, just as the Navajo attribution may be based on the cultural conception that an injury can turn into a sore that does not heal, so the Anglo-American attribution may be based on the cultural conception that an injury can initiate an abnormal growth process, assuming an analogy between the "lump" caused by injury and a tumor. Aside from this, we can conclude that, despite over a century of assimilative pressure and

despite the fact that all Navajo patients had received biomedical hospital treatment, the Navajo causal construal of cancer remains culturally distinct from that of Anglo-Americans. Given this general conclusion, we shall take a step further into the Navajo ethnotheory of disease etiology by examining the second leading causal element for Navajos, namely lightning.

LIGHTNING AS A CAUSE OF CANCER

The single ethnographic fact that poses a dilemma for the present inquiry was clearly stated by Wyman and Kluckhohn (1938:15): "In most cases one factor is thought of as being able to cause a variety of maladies, with one or two outstanding. Likewise, the same disease may result from one of various factors." It is evident from the data in Table 5 that neither Navajos nor Anglo-Americans identify a single causal element for cancer in the way one might in the classical model of contagious diseases in biomedicine, although the Navajo causal construal includes a greater diversity of elements. If most factors also may cause a variety of diseases, the question becomes whether lightning bears a specific causal relation to cancer, or whether it is equally a factor in other diseases. Most scholars of Navajo culture agree that lightning is indeed a very commonly cited cause of illness, so data suggesting a more specific relation between lightning and a particular disease must be evaluated very carefully.

A tentative step toward determining how frequently lightning is associated with other diseases at first appeared to disconfirm the specificity hypothesis. A physician colleague reported on ten traditional Navajo patients none of whom had cancer; fully five of them attributed their illness in some degree to lightning. However, two of those patients explicitly told the physician that they feared their problem might *turn into* cancer. These included a patient who had suffered a direct strike and someone shot by a witch with wood from a lightning-struck tree. A third was suffering from stomach ulcers, which are related to cancer as a member of the class of sores that do not heal.

These data are inconclusive but warrant pursuing the issue. Given that Navajo ceremonials are primarily directed toward removal of whatever etiological factors are determined to be active, indirect evidence can be marshaled on the basis of what kinds of traditional healing ceremonies are used for cancer patients. In this respect, we must consider Levy's observation (1983:132) that "no Navajo disease is known by the symptoms it produces or by the part of the body it is thought to affect. . . . Nevertheless, certain groups of healing ceremonies appear to be associated with some symptoms and not others, while several other ceremonies appear to be good for a broad range of symptoms." This issue of generality in the efficacy of healing ceremonies is complicated by the observation that cancer is not a single disease but a class of diseases exhibiting a variety of symptom patterns. However, I have shown above that the concept of cancer has sufficient integrity within Navajo thought to be typically associated with a more or less discrete cause.

The role of lightning in conceptions of cancer causation is affirmed by patients'

accounts of their use of traditional healing ceremonies in conjunction with biomedical treatment (Table 6). The standard ceremony used to remove adverse effects of lightning is the Shooting Chant (*na'at'oee*). In contrast, the conceptualization of cancer as a kind of sore (*kóód*) does not appear to prompt the use of those ceremonies described as especially suited for sores and boils, namely Eagleway, Eagle-Trappingway, and Beadway (Wyman and Kluckhohn 1938:29; Sandner 1979:45).

A more systematic test can be performed following the method used by Levy, Neutra, and Parker (1987) to establish a degree of specificity in the use of certain ceremonies for seizure disorders and depression. Having ethnographically determined a group of ceremonies that appeared to be associated with these two disorders, Levy compared the proportions of types of ceremonies used by a diagnosed group and a control group. For both groups of disorder, the results were statistically significant. What is important for the present work is that Levy's analysis distinguished disease-specific ceremonies from generalized or "broad-spectrum" ceremonies and that prominent among the latter was the Shootingway group. However, when a similar analysis is done comparing the group of Navajo cancer patients against Levy's control group, the result is that significantly more cancer patients have had Shootingway performed than have members of the control group. This analysis is shown in Table 7, juxtaposed to the comparable analyses from Levy's work.⁶

An additional element of specificity is added by the kind of Shootingway used. Navajo ceremonies are typically divided into male and female versions. Not all informants specified which had been performed over them, but when they did, it was always the male variant, except in one case. This exception was the only medicine man among the patients interviewed, and he prescribed the

TABLE 6
Traditional Treatments Used by Navajo Cancer Patients

Major sings		
	Shootingways	12
	Nonspecific	
	(Evilway, Enemyway, Lifeway, Blessingway, Enemy Lifeway, Windway)	14
	Mating of Reptiles	2
Other treatment		
	Navajo herbs	
	(Lifeway, Pus-eater, protection prayers)	17
	Peyote	8
	Sucking cure	3

TABLE 7
Specificity of Navajo Sings in Treatment of Seizure, Depression, and Cancer

	Seizure Patients	Depressed and Control
Specific for seizures (Mountainway, Coyoteway Handtremblingway, Frenzy Withcraftway)	29	1
Nonspecific and not for seizures	<u>66</u>	<u>160</u>
Total	95	161

Chi-square = 48.8, $p < .0001$
 Source: Levy, Neutra, and Parker (1987:92)

	Depressed Patients	Seizure and Control
Evilways	12	76
All others	<u>8</u>	<u>160</u>
Total	20	236

Chi-square = 6.46, $p < .05$
 Source: Levy, Neutra, and Parker (1987:93)

	Cancer Patients	Control
Shootingways	12	24
All others	<u>14</u>	<u>117</u>
Total	26 ^a	141

Chi-square = 11.02, $p < .001$
 Source: For control group: Levy personal communication
 a. Excludes Christian fundamentalists

female version for himself because he had already had the male version years earlier. In my interviews it was more common for patients to refer to the ceremony specifically as *ó'oos'ni'ji* (Lightningway) or *it hodiitliizhji* (Lightning-Struckway). Those who were able to specify that the Shootingway was of the male version (*na'at'oee bikq'ji*) tended also to be the ones to specify that the ceremony was of the Lightning-Struckway, describing the effects of a direct strike. In fact, Wyman and Kluckhohn (1938:23) distinguish subvarieties of the Male Shootingway (Upper Regions Side and Thunderstruck Side) that roughly conform to the distinction between *ó'oos'ni'ji* and *it hodiitliizhji*. However, they indicate that the former is probably associated with flash lightning while the latter is associated with heavy lightning accompanied by thunder. The present data suggest more that a distinction is made between indirect exposure (passing

by a lightning-struck tree) and direct exposure (having contact with lightning itself) or perhaps that *ó'ooos'ni'jii* is a more generalized term for any Shootingways directed toward lightning as an etiological factor.

In spite of the statistical support provided by data on ceremonial use, one may justifiably remain uneasy about the specificity hypothesis associating cancer and lightning. A final piece of evidence that supports the association was provided by a reservation physician in primary care. I spoke with this physician following a particularly heavy summer of lightning strikes, which had resulted in numerous patients coming for treatment to the IHS hospital and a consequent wave of prophylactic Shootingway ceremonies among hospital staff exposed to these patients. The physician stated definitively that, although she would not have noticed it if months earlier I had not mentioned my theory about lightning and cancer, she had observed that lightning-struck patients invariably expressed concern that their injuries could turn into cancer. Based on this and the above data, it can be asserted that lightning has more than a chance association with cancer among Navajos.

Given this ethnographic fact, it remains uncertain how old the association may be. Of the two cases of cancer cited by Reichard (1950:97), neither was attributed to lightning. These cases could be interpreted as counter to the present findings or could indicate a change since Reichard's time in the traditional understanding of cancer, a change perhaps related to the awareness that the "radiation" treatment often used for cancer bears some conceptual similarity to lightning. Indeed, one of my medicine man informants compared Navajo and biomedical cancer treatments by noting that, like the hospital doctors, "we Navajos have a radiation ceremony, too."

While this question cannot be definitively resolved, more can be said about the place of lightning in Navajo myth, daily life, and the experience of illness. Although patients consistently used the general everyday term for lightning (*ó'ooos'ni'*), lightning plays a prominent role in Navajo myth, where it is distinguished into varieties of zigzag (*'atsinilt'ish*), forked (*hajilgish*), and flash or straight (*hatso'oolghal*). In myth lightning belongs to the class of inherently dangerous or evil things, used by the deities as a tool, weapon, or conveyance (Reichard 1950). In another respect, lightning is itself the manifestation of a class of deities or Holy People, the Lightning People.

However, lightning is not only a cosmological fact of life for the Navajo, but an ecological fact of life as well. It is an extremely common feature of the Southwest desert environment, so much so that at certain times of the year one can see several distinct thunderstorms moving across the expanse of sky at the same time. Navajo children learn the same caution about playing around lightning that urban Anglo-American children learn about playing near street traffic. The lesson is brought home by periodic fatalities from lightning strikes, which according to one reservation physician occur at the rate of at least one per year.

The pervasiveness of lightning is illustrated by the diverse circumstances of exposure cited by informants. One man recounted that lightning hit the

electric line going to his house and knocked out the power four years prior to his illness, while another told how it hit the telephone line while he was talking, knocking the receiver out of his hand and deafening him as well as initiating his cancer. A woman cited an incident from childhood in which lightning struck an abandoned car in which she was playing with other children, burning some of them, while another recalled from boyhood that lightning struck many times around a wagon in which he was riding. One informant stated that there was a lot of lightning around his ranch, and another related a series of incidents in which he helped revive a lightning-struck cow, the family cornfield was struck by lightning, and he, as a thoughtless youth, counted the bones from lightning-struck sheep.

One man reported that a relative's death from a malignant brain tumor was traced to lightning striking a nearby tree while she was herding. Half her flock was killed, as everything around her turned blue and she inhaled the smell of smoke and burned hair and flesh. She partially blacked out, experiencing numbness throughout her body along with hot and cold flashes, and the campfire was perceptually distorted to appear as if it were a little glowing dot. Over the next several years, she experienced regular headaches, eventually began passing out, and finally had a seizure and was taken to the hospital, where the cancer was diagnosed.

Yet lightning is more than a cosmological and an ecological fact of life; it is also a metaphorical fact of life, insofar as the category of lightning extends beyond storm-caused lightning to other forms of radiant energy. Thus one woman stated that the principal cause of her cancer was that she had picked up her children after they had been knocked out by touching a live electrical wire and only secondarily mentioned that lightning had also struck a building in which she was attending a Peyote meeting, following which she inhaled its smoke; when the cancer subsequently spread to her back, it felt like a lightning shock. For another, the cancer was caused by radiation from a uranium mine, also understood as a form of lightning. Yet another informant was a welder who assimilated his exposure to the flames and fumes of his torch ("the smell got into me") with the experience of having been exposed to natural lightning in boyhood while herding sheep. One informant cited the breathing of fumes while working as a firefighter against a lightning-caused forest fire. Evidence from a patient and a medicine man informant also suggests that exposure to the sun may be considered to be in the same broad category of lightning.

The broader ethnographic conclusion that can be drawn from these data is that the Navajo category of lightning is in fact metaphorically extended in two directions, cosmological and ecological. The literature on Navajo cosmology has long reported that lightning is mythically analogous to snakes, arrows, and other "shooting" phenomena. Indeed, among my informants there were three cases in which snakes were involved in the etiology of cancer and in two of these appropriate ceremonies were performed (see Table 6); this may implicate the lightning-snake analogy in the analysis of specificity among causes of cancer. In addition, the category of lightning is metaphorically extended to include such

ecological factors as nuclear radiation, sunlight, electricity used for lighting, cooking on ranges or in microwave ovens, and television. One informant reported that one should eat homegrown meat rather than store-bought meat, not because the latter contains chemical preservatives as Anglo-Americans might fear, but because commercial livestock is sometimes subjected to electrical stimulation to enhance growth. Thus it appears that "lightning" in its various aspects is understood by contemporary Navajos to be a principal form of environmental pollution.⁷

CONSTRUING SPECIFICITY: FOUR METHODOLOGICAL PROBLEMS

Specificity is taken for granted as a goal of scientific research, and it is therefore expectable that we be concerned with identifying forms of specificity in the ethnomedical systems we study. Theorists in medical anthropology have recently developed a variety of analytic frameworks for making sense of the complexity of etiological reasoning encountered in the ethnological record. I have already noted the necessity of distinguishing between etiological and descriptive principles in systems of disease classification (Good and Good 1982). Kleinman (1980) has elaborated a framework for the analysis of specific illness episodes, placing etiological understandings in the context of understandings about the course of illness, pathophysiology, appropriate treatment, and expected outcome, and has emphasized the need to distinguish professional, folk, and popular etiologies. Young (1976) has identified four categories of information coded in explicitly etiological systems, including agencies (immediate causes, precipitating agents, and intermediating or predisposing agents), events or circumstances, instrumental or efficacious actions, and biophysical processes. Zempléni (1985) points out that illness etiologies must be understood in the context of how other kinds of misfortune occur as well; not only may an illness be the result of several interacting causes, but a particular cause may produce negative occurrences other than illness. He asks that etiological analysis make careful logical distinctions among instrumental (how) cause, efficient (who or what) cause, and ultimate (why) cause, between causes predicated on temporal sequence and those predicted on a conjunction of circumstances, and between causes determined a priori and a posteriori. Laplantine (1987) offers a series of analytic distinctions—between causes that presume an ontological disease entity and those that refer to a relation between the afflicted and his surroundings, between causes of exogenous or endogenous provenance, between causes that operate by adding a noxious element or subtracting a vital one, and between the ultimately maleficent or beneficent effects of the causal agents.

These considerations go far beyond the kind of specificity dictated by the canons of biomedical science, which has to do with the specificity of diseases as discrete entities (Campbell 1976) and the doctrine of specific etiology that presumes one cause for one disease (Dubos 1959). Their theoretical importance lies in the determination of which of these multiple etiological categories are

elaborated in particular ethnomedical systems and of the way these categories articulate with broader cultural goals, meanings, and priorities. If, for example, our analytic purpose were only to identify alternative loci of the specific in the Navajo system, we could do so, but this would only beg the broader questions about cross-cultural differences in reasoning about illness. To be sure, my data from bicultural medicine men indicate a measure of specificity between causes and symptoms: killing a dog may cause "gas," attending a funeral may cause numbness, mistreating an aquatic animal may cause diabetes, exposure to lightning may cause heartburn. Likewise, there is a measure of specificity between certain classes of complaint and herbal/animal/mineral remedies: hearing problems should be treated with a preparation from mountain sheep, vision problems with a preparation of the stinkbug, diarrhea with white clay, cancer with a medicine that "smells spoiled." The cultural logic behind these associations is more or less evident, as in the production of heartburn by the burning radiation of lightning or in the sympathetic connection between the rotting of cancer and its treatment by a spoiled-smelling medicine.

The specificity of a relation between cancer and lightning is of a different order, in terms of both defining the disease and identifying causal attributions. As I have noted, even in biomedicine, cancer is as much a group of diseases as a single disease entity, with the link among the diseases being the processual feature of aberrant, unchecked growth. This disease concept is taken up into a Navajo system unaccustomed to specifically named diseases, with a tendency toward etiological rather than descriptive disease concepts, and which interprets the unifying processual feature not as growth but as rotting.

The choice of the term causal construal to represent my empirical findings reflects the nature of the data as a repertoire of causal elements brought to bear by patients afflicted with a particular illness. This term does not distinguish which elements are regarded as specifically causal, as precipitating events, or as predisposing conditions. It also does not differentiate between which elements particular informants were certain about and which they speculated might be involved. Neither does it delineate possible differences between lay attributions and those learned by patients through consultation with specialist medicine men. Most of the Navajo patients generated a causal construal consisting of multiple elements totalling as many as six, with only seven citing a single causal element. In comparison to the Anglo-American data, lightning can thus be understood as a cause of cancer specific to Navajo ethnomedicine, but by no means does lightning conform to the biomedical doctrine of specific etiology. Furthermore, we have seen that lightning itself is a category representing a greater range of phenomena than the meteorological.

Because of the multiplex nature of both cancer and lightning as cultural categories, their causal connection must be understood by a less direct method than those outlined immediately above. One must define the semantic illness network (Good 1977), the system of relevant interrelated concepts within the cultural system. The principal conceptual link in our case is between the understanding of cancer as a *rotting* sore and the effects of *radiation* as burning

and eating a person's insides. The primary mechanism by which the disease enters a person is inhalation, which can include the electrical fumes of a direct strike, smoke from a lightning-caused forest fire, the rottenness of flesh from a lightning-struck animal, and, by extension, the stench of a rotting road-killed animal. Lightning is the prototypical form of radiation, but radiation is nothing other than a contemporary interpretation of the traditionally broad category of *shooting* phenomena, albeit with less emphasis on traditional exemplars such as snakes and arrows. The category includes electricity, and the medicine man's statement that "our bodies are made of electrical impulses," whether or not it indicates an acculturated opinion, is in conformity with the traditional notion that inordinate exposure to such impulses causes disease by disrupting the harmonious electrical balance of life. Radiation also includes the energy of the sun, and it is therefore relevant to the modern occurrence of cancer that the present world is said in Navajo tradition to be destined for destruction by the sun. To have sexual intercourse when the sun is out is said to cause damage to the sperm, and this may be related to the mythical origin of cancer in the abuse of sexuality.

A comprehensive semantic illness network would account for the other causes of cancer represented in my data, perhaps with the conclusion that there is no necessary relation among elements in either the cultural repertoire of causes or the causal construals made by individual afflicted persons. In concluding the present discussion, I can go only so far as to sketch a series of methodological issues that would have to be taken into account in such an analysis, issues that tie the analysis of etiological reasoning about illness to broader anthropological concerns. These issues can be framed in terms of four underlying conceptual dichotomies: (1) between cause and symptom, (2) between disease as entity or process, (3) between biomedical and traditional ethnomedical systems, and (4) between body and mind.

First is the dichotomy between *cause and symptom* in ethnomedical systems, which is related to the distinction cited above between etiological and descriptive systems of disease classification (Good and Good 1982). This dichotomy is directly relevant to the pragmatics of clinical practice, in that determination of cause in many medical systems has implications for choice of treatment. As we have seen, the Navajo disease classification is based primarily on etiology rather than on symptoms and syndromes. Navajos' relatively greater concern with causal factors is empirically evident in comparison to Anglo-American informants in the present study, as the mean number of responses in Navajo causal construals was 2.7, while that for Anglo-Americans was 2.1. Moreover, only three out of twenty-eight Navajos (11 percent) offered no response to questions about causality, while ten out of fifty Anglo-American patients (20 percent) offered no response.⁸

The relative Navajo elaboration and Anglo-American poverty of causal reasoning reflect more than a cultural divergence in the attention paid to different aspects of the illness experience. The elderly Navajo who complains that they "don't tell me what my illness is at the hospital" may mean not that the doctors

failed to inform him of a tumor in his kidney, but they failed to inform him why he has it. In addition, physicians are faced with the fact that their Navajo patients are concerned about lightning as a sufficient cause of illness; even though asymptomatic, a Navajo may be considered sick following exposure to lightning. In general, biomedical professionals unfamiliar with ethnomedical causal construals may remain ignorant of patient fears that a particular course of illness will be determined by exposure to an indigenously defined cause.

A second conceptual distinction is that between disease as *entity or process*. In a discussion of ontological and relational understandings of disease, Laplantine (1987) shows that both formulations can be found in the cultural history of Western thought about disease. This issue is relevant to a critique of the methodology of biomedicine insofar as comparative (historical and cross-cultural) study throws into relief the role of etiological principles in our own ethnomedical system. Our dominant paradigm is predominantly ontological, defining a "Disease" as a discrete entity or biological "thing":

A Disease is first recognized syndromally—a constellation of clinical features. The Disease has a cause (infective, nutritional, genetic, immunological, etc.); this cause produces characteristic structural changes which in turn cause characteristic functional disturbances which in turn produce the clinical manifestations. (Campbell 1976:50)

This author, a prominent biomedical scholar, makes it clear that the kind of specificity required in our paradigm of the Disease leads to a confusing multiplication of conceptual entities that name the same global problem, but which name that problem from etiological, genetic, structural, biochemical, immunological, or prognostic points of view. At the same time, our paradigm ideally seeks to *reduce* syndromal, functional, and structural understandings to an underlying cause.

The very notion of a cause, however, takes on a particular ontological character because it is understood in relation to the Disease as a thing or entity rather than as a process or event. In the case of Navajo ethnomedicine, it is thus not sufficient to observe a shift in the concept of cancer from descriptive to etiological. As cancer is incorporated into the Navajo cultural pattern, it also becomes less an entity and more an event or process, with a consequent shift in what can be taken to constitute a cause. In broader purview, comparison of etiological systems with or without explicitly defined disease entities should take into account not only their recognition of different kinds of possible causes and of different possibilities for multiple interacting causes, but also the possibility of a different ontological status of the very notion of a cause.

Third, the importance of these problems should not lead one to suppose an indelible distinction between *biomedical and traditional* systems of causal reasoning. This issue bears directly on the ethnopsychology of cognition, in that causal reasoning reveals the structure of the mind as a capacity for generating propositions and seeking explanations about the world. My data on causal

attributions for cancer lead me to conclude that making sense of the illness calls into play distinct *modes* of causal reasoning, but that these modes apply across Anglo-American and Navajo *systems* of ethnomedicine. Injury, diet, and environmental exposures such as radiation are included in the causal construals of both groups, though to different degrees and with varying rationales. It is a matter for empirical determination whether such co-occurring elements are indigenous or borrowed. Likewise, it must be determined whether elements from different cultural repertoires are seen to be compatible or incompatible, whether they can be assimilated to one another by metaphorical processes, and whether the interacting cultural repertoires, as wholes, occupy disjunct or integrated cognitive niches.

A striking example of this complexity comes from an interview with a woman in her mid-thirties, a high school graduate with job experience in medical social services, who was in apparent remission from breast cancer. In response to a question about traditional treatment and ceremonies, she discussed the causal influence of lightning at some length. Later, when asked specifically about what she thought had caused her illness, she replied thoughtfully that there were three possible factors, which she ranked in order of importance. First was the fact that her grandmother and an aunt had contracted cancer; therefore it could be inherited. Second was that she had once been on a regime of the drug depoprovera, which she felt could have had a carcinogenic effect. Third, and somewhat skeptically, she recalled having been in an auto accident in which she bumped her breast against the steering wheel; she did not lend much credence to this cause but refrained from ruling it out altogether. I then reminded her that she had earlier mentioned a fourth cause, namely exposure to lightning. Appearing somewhat startled, she said, "In that case, I'll make the lightning third and bumping against the steering wheel fourth."

Surprised at having the product of traditional causal reasoning juxtaposed to the hierarchical product of a more Anglo-American explanatory model, this woman nevertheless quickly proceeded to integrate the two. The implication is that the Navajo and Anglo-American etiologies are cognitively distinct, but not cognitively incompatible. The problem remains why an explicit question about cause might elicit a response that excludes elements of the traditional repertoire, unless there is a cultural disjunction in forms of reasoning about cause and effect relationships. As I have observed above in citing Adair's medicine man informant and as Benedict (1934) noted long ago about the Dobu, traditional therapeutic systems faced with new diseases may not evolve new therapeutic techniques to cope with them or may define them as outside traditional competence. Likewise, traditional etiological systems may or may not incorporate either new causal elements or new causal rationales.

Finally, the suggestion that there are different modes of causal reasoning leads us to reconsider our methodological reliance on the distinction between *body and mind*, or in the more precise terms of Evans-Pritchard (1937), between *sensible and mystical* causes. This issue bears on the existential rationality of culture, for as Lindenbaum (1979:56) has observed, "Beliefs about the

etiology of disease are statements about the nature of existence, explanations of why things happen as they do." For most illness, the literature on Navajo ethnomedicine assumes a mystical cause, conceived predominantly as spiritual contagion or violation of taboo. My data suggest that, at least among contemporary Navajos afflicted with cancer, a physical cause (injury) ranks prominently alongside a spiritual cause (lightning). Much more significant, however, the data challenge the assumption that lightning itself can be comprehended solely under the concept of spiritual contagion. This issue was framed in a discussion of Navajo disease etiology by Lamphere (1969:292):

Activities involving dangerous animals or natural phenomena [are understood to] automatically arouse the supernatural's attack by weapons or anger, which in turn brings sickness. Until more fieldwork can be conducted on Navajo disease theory, it is only possible to suggest that, in some sense, the natural elements are fused with the supernatural. The snake with which the Navajo might have contact and such *diyin diné'e'* [supernaturals] as . . . the Snake People are, at some level, equated. It is impossible to determine if they are different forms of the supernatural, if the snake is a present-day natural manifestation of supernatural figures of the mythical past, or if they are 2 separate types of phenomena, one natural and the other supernatural, which share common characteristics. Whether one of these possibilities or yet another set of relationships best characterize Navajo beliefs regarding these matters cannot be concluded without more detailed data.⁹

It can be argued that, stated in this way, the problem is in part an artifact of the distinction between the natural and supernatural that was prominent in anthropology twenty years ago. This methodological distinction has three relevant characteristics. First, it is in essence predicated on distinctions between physical and spiritual, material and immaterial, tangible and intangible, or sensible and mystical, all of which presuppose what is typically called a "Cartesian" distinction between body and mind. Second, it presupposes that the supernatural is more truly "cultural" than the natural, in a manner roughly analogous to the way Kroeber theorized that the superorganic stood in relation to the organic. Finally, the traditional approach focused almost exclusively on the abstract cultural definition of the causal agent, bypassing the question of how that cause produced its effect in terms of a cultural phenomenology.

Anthropology today is better prepared to attend to the physical in a definition of the sacred, bodily experience in an understanding of culture, and concrete ethnomedical practices in addition to beliefs. Examining the causal process associated with exposure to lightning exemplifies this methodological shift. Patients in the present study who mentioned lightning typically referred to a specific event in which lightning struck so near to them that they saw a bluish flash and inhaled the acrid electrical fumes. To describe this experience they used the Navajo phrase *shít hodiit'íizh*, which can be translated as "I have

been contaminated by lightning." Based on the vividness of informants' statements and on the existence of a linguistic convention to describe the experience, the concrete sensory dimension of this exposure cannot be downplayed in favor of a concept of spiritual contagion. It is not only the fact of proximity that defines exposure to lightning; at once a person's body is enveloped (external exposure) in blueness (visual modality) and incorporates by inhalation (internal exposure) the acrid haze (olfactory modality).

In emphasizing this embodied dimension of the experience, we can begin to resolve the question of whether lightning is a natural or a supernatural phenomenon for Navajos. It is certainly natural in that it affects people in a physical, organic manner. At the same time, the enormity of the experience, its overwhelming "otherness," qualifies it as a quintessentially sacred phenomenon, culturally elaborated in myth and in Shootingway healing rituals designed to reverse its effects. In addition it is elaborated by temporal extension, in that (for example) going too close to a tree that has been struck by lightning at an earlier time is thought to be equally as dangerous as having lightning strike nearby; but I suggest that the physical encounter is primary to the cultural phenomenology of lightning.

The import of this discussion is not only that it answers Lamphere's call for more detailed data on Navajo disease etiology, but also that it represents a particular way of looking at (or looking for) the data within an anthropological paradigm of embodiment (Csordas, in press). In the present case the methodological shift is away from the problem of defining lightning per se as a cultural phenomenon and toward the embodied human experience of lightning in cultural practice. While the goal of this approach is to collapse the distinction between mind and body in the name of a more comprehensive existential anthropology, it by no means seeks to preempt the biological importance of the body. Indeed, to argue thus in the present case would be to misrepresent Navajo thinking itself. The patient who assimilated the inhaled fumes of lightning with the inhaled fumes from his welding torch as intimately related causes of his brain tumor may have been engaged in biologically relevant speculation as well as syncretic cross-cultural reasoning. Likewise, the Navajo physician whose thoughtful response to my data was that the Navajo theory of lightning as a cause of cancer may correctly intuit a process in which "oncogenes" are stimulated is taking seriously a potential biological consequence of lightning exposure. Medical anthropologists who insist on the priority of determining the biological relevance of ethnomedical categories (Browner, de Montellano, and Rubel 1988) might feel obligated to follow this type of lead. Such work must be considered logically and methodologically secondary, however, to a determination of the human meaning of health-related phenomena through the use of empirical frameworks such as those summarized at the beginning of this section, through careful attention to methodological distinctions such as those discussed immediately above, and through the development of analytic perspectives such as that of embodiment.

NOTES

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2. This position grows out of Kleinman's (1980) formulation of the "explanatory model" of an illness episode, which included not only causal attributions per se, but the afflicted person's understanding of the pathophysiology and course of the illness as well. These aspects have been downplayed by researchers professing to take up Kleinman's model.

3. The table shows neither prevalence nor incidence *rates*, but the actual prevalence of cases at a particular point in time when the present research was carried out. Care should thus be taken, for example, in interpreting the relatively inflated number of cases of cervical cancer. Differences in the prevalence of different types of cancer may in large part be attributable to different durations (survival times) and cure rates, the comprehensiveness of screening programs, and/or the percentage of false positives in diagnostic tests.

4. For purposes of this research, I developed an open-ended instrument elaborating on the explanatory model interview for specific illness episodes developed by Kleinman (1980). The interview covered a variety of aspects of illness experience and patient-doctor communication and provided data on causality for both groups. The original English version was translated into Navajo and subsequently revised in light of the adaptations in concept and phrasing that became necessary in preparing the Navajo version. Navajos who chose to be interviewed in English received the same version of the interview as the members of the Boston group did.

6. Although it has been shown that elderly Navajos use Shootingways significantly more frequently than the control group (Levy, personal communication), this factor cannot account for the results among cancer patients, since the performance of Shootingways was distributed across the age range of our sample.

7. Indeed, one could hypothesize that a Navajo understanding of the effects of ozone depletion would be cast in these terms. This is certainly the case with respect to the connection between uranium and cancer, as is evident in the following statement by one of our bicultural medicine man informants:

People use to say, "That mountain right there is harmful, don't bother it." They'll say, "What's harmful about it? Nothing harmful unless you fall off of it." But sure enough, you dig in there, there is uranium, so powerful, so dangerous you don't mess with it. That's what they [traditional Navajos] were talking about.

Also relevant is the notion of electromagnetic pollution current in Anglo-American popular culture, particularly with respect to possible negative health consequences for people living in proximity to high-tension electrical transmission lines.

8. The means of 2.7 and 2.1 were calculated by dividing the total number of responses (68 for Navajos, 85 for Anglos combining the Related and Caused categories) by the total number of respondents (25 for Navajos, excluding 3 who offered no response, and 40 for Anglos, excluding 10 who offered no response). The percentage of those who offered no causal construal is then 3 of 28 (11 percent) for Navajos and 10 of 50 (20 percent) for Anglos (compare Table 5).

9. Lamphere's discussion of natural phenomena contrasts what she takes to be a Navajo emphasis on features of the external environment, such as animals and meteorological phenomena, with Turner's (1966) description of Ndembu emphasis on bodily phenomena. In particular, she argues that Navajo color symbolism is associated with such external natural phenomena rather than with body substances. However, data from the bicultural medicine men interviewed in the present study indicate that while colors come from the sun, the rainbow colors are the *same* as the colors of sandstone *and* of the body. The following scheme of seven colors and seven body organs (not body emissions as with the Ndembu) was offered: white—bone, yellow—marrow, glitter—fat, brown—skin, gray—internal organs, red—blood, and black—hair. These seven internal organs correspond with seven external body parts (the order of relation is uncertain), namely foot, leg, waist, trunk, arm, head, and nose, and with a series of seven herbs used to cure ailments of the corresponding organs and members.

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