The elementary forms of the medical life: sacred and profane in biomedical cosmology

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Abstract

This thesis examines the place of metaphor in biomedical knowledge about two major public health problems: cancer and coronary heart disease (CHD). Specifically, it considers why cancer is constituted by biomedicine in obviously metaphorical concepts that are also highly pejorative. Conversely, the metaphorical dimension of the biomedical knowledge concerning CHD is less obvious and less negative in its connotations.

This thesis posits that the difference in linguistic styles associated with cancer and CHD can be accounted for by whether knowledge about them confirms or challenges the knowledge and value system of modernity. Cancer, as construed by biomedicine, appears to confound some important tenets of the epistemology and knowledge of modernity. In particular, it confounds the idea that the body is a machine and that nature is an inert order obeying objective laws. It thus suggests that the universe, including that of bodies, is not entirely subject to rational understanding and control. Women having irrational bodies and an affinity with unruly nature are primary sites for cancer. It is therefore hardly surprising that cancer's metaphors express a fear that order based on masculine rational agency is fragile. By contrast, biomedical knowledge about CHD appears to confirm key aspects of modernist knowledge. Specifically, it suggests that the (masculine) body can be understood as a machine that exists as part of a wider domain of nature that is inert and is fuelled by objective laws. Unlike cancer, which is depicted as mysterious and arcane, CHD is presented as an ailment with causes that are well understood and treatment that is effective, thus affirming the truth of rationality and technology. Coronary heart disease is construed overwhelmingly as a disease affecting men exercising their capacity for rational agency, free from the 'dictates' of an irrational body. Coronary heart disease is depicted as a disruption of supply and demand rather than as a threat to social order itself.

In Durkheimian terms, sacred things can be pure and beneficent or they can take impure and threatening forms. Cancer expresses the impure, threatening dimension of sacredness in exposing threats to the knowledge and order of modernity. Conversely, coronary heart disease is profane, in those terms, since it offers apparent confirmation of the knowledge and order of modernity. Cancer makes us aware of deeply held values by making us conscious of threats to them but the knowledge of CHD is so congruent with the knowledge system of modernity, that it does not provoke us to examine that framework; it merely affirms our routine and mundane view of the world.

These findings suggest that biomedicine can be regarded as a secular religion because it acts as a cosmology. Knowledge of the body and its ailments is set within a wider conceptual framework and value system recognizing and naming sources of order and danger. This further suggests that while biomedicine may be rightly regarded as a technical and instrumental body of knowledge, it is nevertheless fuelled by and intertwined with deeply held values and convictions that are beyond the domain of rationality. The unexamined, a-rational elements of biomedicine have been virtually ignored within public health and explain some of its limitations in defining and responding to familiar public health problems.

Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university and, to the best of my knowledge and belief, the thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis. I consent to the thesis being made available for photocopying and loan, if deposited in the Library, if accepted for award of the degree.

Signed _____ Date _____

Jane Edwards

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Introduction

The background to this thesis

This thesis has undergone considerable evolution and significant elements of my biography are intertwined with these pages. My early academic training in anthropology and history stirred my interest in the significance of symbolism and my conviction that contemporary phenomena are best understood in historical perspective. Taking one of life's left turns, I became a nurse after my honours degree and, once qualified, worked in an oncology unit for a few years, acquiring a certain level of technical knowledge about cancer and its treatment. However, the technical detail existed alongside my awareness of the profundity of the issues the job entailed: hope, suffering, fear, courage, and life and death were daily elements of my working life; as they would have been in many other nursing specialities. Without having heard of Susan Sontag, I witnessed the power of words and the weight of covert meanings they carried for those with cancer, their friends and families, as well as for those of us who cared for them.

After a few years of oncology nursing I decided to pursue a career as an academic. For a variety of reasons, I chose to undertake a PhD in an academic department of public health, initially looking at the role of language in constructing the experience of cancer. I also began working as a neophyte academic and that experience began to change the shape of my thesis. Simultaneously, I was discovering a Durkheim that I had not encountered as an under-graduate. This Durkheim was not a rabid positivist interested in manipulating variables, nor a myopic structural functionalist. This 'new' Durkheim was interested in the power of symbolism, treated notions of the 'sacred' respectfully rather than reductively, and announced, long before Foucault, that knowledge was socially constructed (Durkheim 1965). I had, of course, read Sontag's *Illness as Metaphor* (1987) by this time and was impressed by her deft analysis of the pervasiveness and power of metaphor and the way it created the meanings associated with diseases. However, I was perturbed that she clearly let biomedical knowledge 'off the hook', as not implicated in the crimes of which she accused metaphor. While I did not know whether biomedical knowledge was metaphorically constructed, the literature I had been reading on the sociology of medical knowledge suggested that it could not be regarded as an a-social, value free truth. My experience in oncology had also made me aware of the power of biomedical language and that it was not a value–free, or innocent, vocabulary.

One of the subjects I taught stipulated that students undertake a research project on both cancer and coronary heart disease as public health problems. As I read their work and listened to their oral presentations, I was struck by the relative equanimity of their approach to coronary heart disease (CHD) and the mixture of reverence and dread their discussion of cancer evinced. Cancer was accorded an almost mystical status while CHD was regarded as mundane by contrast. This sense was reinforced by recollections (from my nursing days) that cardiology nursing was perceived as 'clean' while oncology was, as I was told more than once by colleagues attempting to be sympathetic, 'dirty nursing'. In addition, the heroism of trying to save the lives of cardiac 'patients' was contrasted strongly to the supposedly bleak and unrewarding task of caring for people who were, in many instances, dying. Equally, listening to my student's work, I wondered why the perception existed that 'we' understand and treat coronary heart disease well, while 'we' grapple less successfully in understanding and treating cancer. The epidemiology of cancer and CHD did not sustain these perceptions, nor did survival rates for the two ailments. Finally, while it seemed obvious that concepts such as 'aggressive cells' were metaphors, the notion of the heart as pump seemed accepted as merely a literal truth. Why should this difference exist and what was its significance?

What had previously been done in the field?

Sontag (1987) showed that metaphors are the basis of the meanings linked to diseases. The study of metaphor has been dominated by disciplines other than sociology, notably psychology, education and the philosophy of language and of science (Ortony 1993: X111). It has also been investigated within anthropology. Mary Douglas (1978), while not explicitly labeling her work a study of metaphor, considered the way in which social organization metaphorically constituted understanding of the biological body. Later, American anthropologist Emily Martin investigated the way metaphor shaped medical knowledge of physiological processes undergone by (most) women: menstruation, childbirth and menopause (Martin 1989). Where, I wondered, was the sociological literature examining the role and social significance of metaphor in biomedical thought? By the time Martin's (1989) work appeared, the content of biomedical knowledge was squarely on the theoretical and empirical agenda of the sociology of health and illness. Wright's and Treacher's landmark *The Problem of Medical Knowledge* had been published in 1982 setting out the premises of a 'new school' of thought—constructionism—and offering case-studies demonstrating its analytical utility. Nevertheless metaphor figured only in one of the case studies in that volume, Marcovich's historical essay on the work of an English physician (Marcovich 1982).

The study of metaphor within the discipline of anthropology has proved very fruitful. Mary Douglas' *Natural Symbols* (1978) took an explicitly Durkheimian approach to her topic, examining how society constrained perception of and response to the body. Her work has been a profound influence in the sociological and anthropological study of the body (Shilling 1994) and has also made a significant contribution to the study of pollution and notions of risk (Turner 1991). However, Douglas' analysis made no reference to biomedical knowledge of the body or disease. Martin's work (1989) examined how metaphors intersect with social interests through the medium of knowledge. Her analysis is an elegant account of how the capitalist mode of production and a set of metaphors based on the concept of productivity intertwine in the production of medical knowledge about women's bodies. Montgomery (1991) demonstrated the ubiquity of metaphor in biomedical thought and also revealed how some metaphors become accepted as literal truth over time, thus hiding their metaphorical origins. Later work by Martin (1990; 1993) demonstrated the way aspects of social organization in late capitalism metaphorically framed medical understanding of the immune system and its disorders. In a study of the metaphors linked with AIDS, cancer and heart disease, Weiss (1997) shows how each of them articulates different aspects of social life.

This small body of literature indicates how useful a study of metaphor is for analyzing the diverse and frequently symbolic influences on the formation of biomedical thought. Weiss's work (1997) however does not focus explicitly on the role of metaphor in the construction of biomedical knowledge. While Montgomery (1991) does take biomedical knowledge as his focus, he does not analyze how metaphor shapes biomedical understanding of particular diseases. Martin's work, (1989; 1990; 1993) while being close to my own interests, offered no comparative analysis of the metaphorical 'framing' of different diseases by biomedicine. The differences of meaning associated with and the differing attitude to cancer and coronary heart disease seemed worthy of investigation. Nor was I convinced that Martin's (1989) framework would offer the only way of understanding this difference. The kinds of meanings linked to both cancer and coronary heart disease seem to have strong affinities with Durkheim's notion of a religious distinction between sacred and profane entities. Further his argument that science and religion are structurally and functionally similar is intriguing and has received little attention within the sociology of health and illness. Anthropologists have investigated the link between healing and religious systems in 'exotic' societies but not in the setting of the contemporary 'West' (Comaroff 1982). Sociologists have asserted that that biomedicine is a secular religion (White 1991; Turner 1995) but this claim has failed to generate substantive investigation within the sub-discipline.

An analysis of biomedical knowledge of cancer and coronary heart disease would identify whether that knowledge is constituted through metaphor and, since metaphors generate the meanings attributed to diseases, it would also shed light on whether they were accorded different meanings by biomedicine. It also provided a test of my 'hunch' that the different meanings I suspect are attributed to them can be explained by Durkheim's concepts of sacred and profane. Accordingly, I undertook a thematic analysis of biomedical writing on cancer and coronary heart disease. Thematic analysis is a variant of content analysis in which key themes are identified (Daly; Kellehear and Gliksman 1997: 134-135). More detail on the rationale for text selection and the method of analysis is provided in the methodology Chapter.

This thesis thus addresses the following questions:

- Is biomedical knowledge of both cancer and coronary heart disease metaphorically constituted knowledge?
- Does biomedical knowledge express or constitute different attitudes to these disorders?
- How do the meanings associated with each ailment link to social and cultural concerns?
- Do the concepts of sacred and profane help explain attitudes and medical knowledge of cancer and coronary heart disease?
- Can Durkheim's claim that science and religion are both religious enterprises be applied to biomedicine?

The answers to those questions in this thesis will add to sociological knowledge about the influences on the production of biomedical knowledge by examining the link between metaphor, medical knowledge and religious symbolism. It may expand awareness of the range of influences that have traditionally been considered in the formation of medical knowledge. The notion that religious symbolism, expressed in the distinction between things that are sacred and profane, may play an important part and under-recognized role in the production of medical knowledge has scarcely been considered in the sociology of health and illness. For several years now, I have earned my living as a 'public health academic' and I will therefore briefly consider some of the implications of this thesis for public health in its conclusion.

I do not, however, critically evaluate the concepts of sacred and profane as originally developed by Durkheim. Rather, I apply them in a relatively abstract way, seeking to discover whether they have heuristic value in analyzing the metaphors associated with cancer and coronary heart disease. Nor do I consider cases that might be anomalous for Durkheim's concepts of sacred and profane. As valuable as such work would be, it is beyond the scope of

this thesis. The work set out here is a 'first-step' in exploring how Durkheim's work might inform more thorough investigation of the link between metaphor, religion (cosmology) and medical knowledge.

Thesis structure

Given the paucity of sociological literature on the relationship between metaphor and medical knowledge, the options for a conventional literature review were limited. Accordingly, I reviewed the approaches to medical knowledge by what I considered to be the epistemologically distinctive schools of thought in the sociology of health and illness—'phenomenological' approaches, those perspectives deriving from Marxist thought and, lastly, constructionism.

In chapter two, I outline Durkheim's theory of the homology of science and religion, assessing whether biomedicine qualifies as cosmology in Durkheimian terms. I then outline his theory of sacred and profane and discuss contemporary assessment and use of these concepts. Finally, the chapter takes a brief detour into some aspects of seventeenth century intellectual history to examine the foundations of modernist thought because the origins of modernist cosmology are to be found here.

My epistemological premises and methodological principles are outlined in chapter three. This chapter also outlines my method of selecting material for analysis and the method I used in assaying these documents.

Chapter four focuses on metaphors associated with cancer. I briefly sketch some aspects of the way cancer has been conceptualized in the history of 'Western' medical thought. The two biomedical accounts that were dominant in the 20th Century—immunology and molecular biology—are then outlined. Each account offers a metaphor of society and the basis of social order. The same metaphorical repertoire, centring on deviance is utilized by both theories, thought they accent somewhat different dimensions of it. Both accounts, however, are linked by the themes of gender and disorder.

A brief history of 'Western' medical thinking about the heart begins Chapter five—the concept of heart disease did not begin to take shape until the latter part of the nineteenth century. The twentieth century definition of the cardio-vascular system and of coronary heart disease is discussed. Coronary heart disease, including its causes and mechanisms, is framed around a central metaphorical understanding of society as a market, requiring a balance of

supply and demand. The biomedical account of coronary heart disease is metaphorically linked to notions of gender and rationality.

In chapter six I outline the key elements in the metaphors that are implicated in medical knowledge of cancer and coronary heart disease. I analyze them in relation to key elements of modernist cosmology.

Chapter seven re-visits the argument that biomedicine can be considered a cosmology because it construes the 'universe' of modernity as embodying a set of dichotomous qualities that look very much like those normally addressed by religion. In particular, cancer and coronary heart disease do metaphorically represent the attributes of sacred and profane, as identified by Durkheim. I briefly consider the implications of this framework for sociological approaches to health, illness and healing, as well as for public health responses to them.

Chapter 1

Instrumental Knowledge: biomedical knowledge in phenomenology, Marxism and constructionism

… the manner in which social interest becomes seamlessly incorporated in the set of tacit assumptions about reality is the key to the social significance of knowledge. This requires that we explore how interests become associated with the symbolic forms which give shape and coherence to our system of implicit knowledge itself…we might examine both the symbolic structure of ideological substance and the ideological motivation of symbolic form (Jean Comaroff 1982).

Comaroff's observation is an epigraph for this chapter as it suggests that in any given context the study of symbolism is a crucial element in understanding the social significance of knowledge. 'Symbolic forms', in Comaroff's view help shape knowledge. In this chapter, I consider whether metaphors associated with disease are one of the key 'symbolic forms' that shape more formally articulated knowledge and make it meaningful through linking it with what Comaroff terms "…tacit assumptions about reality" (1982: 50). The work of Susan Sontag is a beginning for this enterprise because of her groundbreaking work on the metaphors associated with disease.

SONTAG'S ILLNESS AS METAPHOR

Sontag's *Illness as Metaphor* remains one of the most eloquent and insightful demonstrations that diseases acquire meaning through the metaphors with which they are imbued. Sontag exposes the way disease metaphors reveal the social, political and economic concerns of the context in which they are formulated. Cancer, for instance, reinforces dominant political and social values by metaphorically construing phenomena as diverse as Maoism, masturbation and the Vietnam war as deviant (1987: 87). Disease metaphors also map the conceptual boundary demarcating nature and culture. Whereas tuberculosis' (TB) metaphors offer a romantic vision of nature as pure and life enhancing, cancer's metaphors uncover a fear that nature can "turn paranoid" (1987: 73).

Tracing the metaphors associated with tuberculosis (TB) and cancer, Sontag uncovers the way they reveal prevailing assumptions about what constitutes a good human being, through evaluating the moral status of sufferers:

> As once TB was thought to come from too much passion, afflicting the reckless and sensual, today many people believe that cancer is a disease of insufficient passion, afflicting those who are sexually repressed, inhibited, unspontaneous, incapable of expressing anger (1987: 26).

However, such moralistic judgements are inseparable from the respective economies in which they flourished. The passionate profligacy of the TB sufferer resonated with other fears of 'financial incontinence' in an economy that demanded "…the rational limitation of desire" (Sontag 1987: 67). Cancer's metaphors, by contrast, highlight the pathology of inhibition: an unwillingness to consume in a late capitalist economy in which rampant consumerism is a virtue, if not a necessity (Sontag 1987:67).

Metaphor also shapes biomedical response to cancer. Metaphors of attack, invasion and colonization invite retaliatory therapeutic responses of almost equal ferocity. ‘Radical’ surgery, bodily ‘scans’ and radio-therapeutic ‘bombardment’ characterize the biomedical language of healing (Sontag 1987: 68-69). In 1971, continuing this bellicose theme, the United States government actually declared "war on cancer" (Sontag 1987: 71-72; Epstein 1992:447).

Apart from revealing prevailing social concerns, disease metaphors also reveal prejudice, misinformation and misunderstanding, according to Sontag (1987). Imputing meaning to disease through metaphor is, in Sontag’s view, an illegitimate enterprise and is only possible in the absence of certain medical knowledge and effective treatment. Indeed, in Sontag’s opinion, the existence of disease metaphors is an index of how much is not ‘scientifically’ known about them. Accordingly, only some diseases are entrammelled by metaphor because of incomplete knowledge and uncertain treatment outcomes. Hence, “Syphilis was limited as a metaphor because the disease itself was not regarded as mysterious, only awful….” (Sontag 1987: 64). Thus in Sontag’s view, metaphor and medical knowledge are antithetical; metaphor exists in the absence of sound medical knowledge. Further, it is medical knowledge of disease that is the antidote to understanding disease metaphorically. In the case of TB, “… the power of the myth was dispelled only when proper treatment was finally developed” (Sontag 1987:39). Sontag acknowledges that medical knowledge about cancer is itself influenced by (distorting) metaphors of warfare, as it distorts political discourse. However, metaphors in medicine only persist because of, “…many uninformed doctors who insist that no significant progress in treatment has been made” (Sontag 1987: 70). That is, metaphors employed within medical discourse only exist because of the incomplete dissemination of accurate medical knowledge among the profession. Once again, knowledge and metaphor stand in contrast to one another. Where progress has been made in understanding and treating cancer, “Concepts have started to shift in certain medical circles….”(Sontag 1987: 70). Clearly Sontag sees the demise of metaphorical understanding, occasioned by the progress of ‘real knowledge’, as part of that shift.

Sontag’s work is one of the most influential, if not one of the finest, exegeses of the metaphors associated with disease. However, Sontag's account is hampered by her uncritical acceptance of the ‘truth’ of medico-scientific knowledge about disease. In Sontag's view, disease has no other truthful meaning other than its biological properties and mechanisms:

> …illness is not metaphor, and… the most truthful way of regarding illness-and the healthiest way of being ill-is one most purified of, most resistant to, metaphoric thinking (1987: Prologue).

Sontag's stance aligns with that of medical positivism in that it assumes that, "…medical knowledge (is) objective and universal and beyond the influence of society" (Short 1994: 220). Sontag's premise is that diseases are fixed in nature and that scientific language, uncontaminated by metaphor, can mirror their intrinsic, objective quality. Sontag's claim, indeed crusade, is that metaphor imputes false meaning to some diseases because it distorts biomedical understanding of them. In so doing, Sontag re-states a fact-value distinction. Biomedical definition of disease is value-free fact. Disease metaphors, on the other hand, express values (mainly irrational), with no factual basis. Greater knowledge and better technology (expressed in more effective treatment) will, in Sontag's view, gradually erode the mystery that breeds metaphor. In relation to currently mysterious diseases it will disappear as biomedical knowledge fills in more of the jigsaw. It is a supremely rationalist, indeed modernist, account. Her prophecy is that the language about cancer, "…must change, decisively, when the disease is finally understood and the rate of cure becomes much higher." (1987: 88).

Sontag is a particularly important exponent of such a position because of her justified status as a public intellectual and because of the quality of insight she provided into disease metaphors in *Illness as Metaphor* and, later, in *Aids and its Metaphors* (1989*)*. However, Sontag's reputation for challenging accepted wisdom makes it all the more surprising that she should be so uncritical about the epistemological status of biomedical knowledge. That a social commentator of her eminence, given to challenging conventional opinion, could offer confirmation of a positivist account of biomedical knowledge is testimony to the kind of dominance it exercises.[1] In offering this assessment of metaphor, Sontag reinforces a deeply entrenched cleavage between a view suggesting knowledge is dependent on and relative to context and one that asserts 'true' knowledge exists independently of context, and is discovered through intellectual and empirical processes mitigating the influence of context. From this latter perspective, 'true' knowledge is knowledge in which, ostensibly, metaphor

[1] It should be noted that Sontag wrote *Illness as Metaphor* in response to being diagnosed with breast cancer and being told that she had a poor prognosis (Clow 2001: 293-294). Her denunciation of the 'victim blaming' theme inherent in many of the metaphors associated with cancer is both understandable and justified. Her experience may also explain her apparent faith in the 'objective truth' of biomedical knowledge.

has no place. Because metaphor is value laden and context driven it is held to be antithetical to true knowledge.

This bifurcation between metaphor and avowedly literal utterance is a long-standing one in the history of medical and scientific thought and practice. Imputing meaning to disease through metaphor has a long, if not glorious, history. Hippocrates observed that epilepsy was metaphorically construed as a sacred disease. Articulating an epistemological position still dominant in contemporary biomedical thought, Hippocrates argued that the metaphorical understanding of epilepsy was contradicted by medical knowledge. The 'sacred disease' is only considered so because people are at, "… a loss to understand it…." (quoted in Enright 1989: 38). For those with true knowledge of the disease, those trained in 'proper' medicine, its metaphorical association with sacredness is mere nonsense. "It is not", says Hippocrates, "any more… sacred than other diseases, but has a natural cause, and its supposed divine origin is due to men's inexperience" (quoted in Enright 1989: 38). Moreover, Hippocrates asserted that the metaphor attributed to the ailment understood as epilepsy acted as a justification for treatment he considered spurious, by those he considered untrained. These untrained practitioners:

> Being at a loss, and having no treatment which would help, they concealed and sheltered themselves behind superstition and called this illness sacred, in order that their utter ignorance might not be manifest. They added a plausible story, and a method of treatment that secured their own position" (quoted in Enright 1989: 38).

THE EPISTEMOLOGY OF METAPHOR

What is metaphor? It is an attempt to describe different things in terms of one another, where such comparison is not literally justified. Aristotle defines it as giving a thing a name that belongs to something else (Lakoff and Johnson 1980: 190). Metaphor implies affinity, suggesting that different things can be understood as fundamentally similar. It is a symbolic enterprise, implying that we cannot understand things in themselves, but only by symbolically linking them to other things. Superficially at least, metaphor is different from literal utterance.

Debate about the epistemological status of metaphor is at least as old as the history of 'Western' philosophy. Aristotle, while hailing the use of metaphor in imaginatively expanding thought, cautioned against confusing it with literal definition (Ortony 1993: 3; Lakoff and Johnson 1980: 190). The debate about the epistemological status of metaphor re-

emerged with particular vigour during the 17th century, as the scientific revolution unfolded and a new understanding of science and rationality took shape (Toulmin 1990; Sawday 1983). Many of the leading intellectual lights of the time insisted that metaphor had no place in 'real' knowledge (Toulmin 1990; Sawday 1983). The presence of metaphor in scientific thought and language attracted particular denunciation by prominent scientists/philosophers of the time (Sawday 1983: 22-25). Hobbes, articulating the positivist assumptions of those opposed to metaphor, argued that science was a particular form of knowledge dependent on 'demonstration', that is empiricism (Toulmin 1990: Sawday 1983). While metaphors may have a legitimate place in literary modes of discourse, in the case of science, he suggested they should be "…utterly excluded. For seeing they openly employ deceit; to admit them into counsell or reasoning were manifest folly" (quoted in Sawday 1983: 23). The assumption underlying this statement is that metaphor invariably distorts knowledge, imposing false meaning on subjects that have an intrinsic meaning mirrored, or translated, by literal description. Protest against metaphorical description though they did, Hobbes and his contemporaries could not avoid it in their own writings: *The Leviathan*, for example, is predicated on the metaphor of the *body politic* (Sawday 1983: 21-35).

This distinction, between positivist and non-positivist views of metaphor, continues to permeate contemporary scholarship on the subject (see for instance Ortony 1993: 1-16). The postivist (or to use Ortony's terminology, the non-constructivist) view contends that metaphor is merely a matter of language and should be distinguished from 'real', that is objective, language, describing an objective reality (Ortony 1993: 2). Literal language, free from the contaminating influence of metaphor, constitutes real knowledge because it ostensibly describes things as they are. From this perspective, all knowledge is capable of literal translation and metaphor is extraneous. Metaphor may be a legitimate literary embellishment. However, it detracts from accurate, unambiguous statements about the world by introducing symbolic dimensions that have no relation to literal truth. Metaphor therefore cannot play a meaningful part in true or objective knowledge (Ortony 1993: 1-16).

According to the logic of this position, therefore, discourse aiming to faithfully represent objective truth should exclude metaphor because it confounds literal understanding, suggesting different things can be understood in terms of one another. Hence, it does not fulfil the requirement to describe things as they are. Metaphor is symbolic, not objective, according to the non-constructivist position. Because this stance juxtaposes objective truth and symbolism, it holds that metaphor is ill-placed in scientific discourse. Ortony articulates this position:

> Metaphors characterize rhetoric, not scientific discourse. They are vague, inessential frills, appropriate for the purposes of the politicians and poets, but not for those of the scientists because the goal of science is to furnish an accurate (ie literal) description of physical reality (Ortony 1993: 2; inclusion in original).

The non-positivist (constructivist) perspective contends that metaphor is a necessary aspect of both thought and language. All thought and language, including that of science, is necessarily and unavoidably metaphorical (Ortony 1993:1-16). We cannot think, much less communicate, except through metaphor. It is not merely a linguistic device (Lakoff and Johnson1980: 3-9). Far from being merely a matter of language, Lakoff and Johnston argue that, "… many of our experiences and activities are metaphorical in nature and… much of our conceptual system is structured by metaphor" (1980: 147). Expressed differently, all thought, and therefore knowledge, is symbolic: we understand and define things by symbolically associating them with something else. The idea of the *body politic*, for instance, symbolically links society and the human body, suggesting we understand them in terms of one another.

METAPHOR AND THE HISTORY AND PHILOSOPHY OF SCIENCE

The place of metaphor within scientific thought has attracted some attention from historians and philosophers of science, as well as from historians of medicine. Niebyl (1992) asserts that metaphor has a crucial role in scientific discovery, because it provides a mechanism for visualizing phenomena not yet completely understood. Theories concerning these new phenomena either are disproved or become accepted as factual knowledge. Once taken as factual knowledge, the metaphors contained within it are 'dead', being virtually transformed into literal knowledge. Metaphor thus has a role to play in ushering in new theory but is passive once transformed into scientific "fact" (Niebyl 1992).

Niebyl (1992) thus continues the Aristotelian tradition of claiming that metaphor enlarges vision, allowing generation of exploratory hypotheses. However, this heuristic phase of scientific practice has to be verified before it is accepted as knowledge. He proposes, in effect, a linear sequence; metaphor generates fresh fields of inquiry, but true knowledge encountered there is a bedrock of hard fact, capable of precise, literal description. Metaphor has little or no place in this field of verified, 'true' science. Niebyl thus contains the rightful place of metaphor in scientific thought, language and practice to, "…pretheoretical stages of (its) development…." (Boyd 1993: 482).

Boyd, however, enlarges the place of metaphor in the development and promulgation of scientific thought. According to him, "… metaphors are *constitutive* of the theories they express…." (1993: 486; emphasis in original). Computing metaphors, for instance, "…have provided much of the basic theoretical vocabulary of cognitive psychology" (Boyd 1993: 487). Contra the position of Niebyl (1992), Boyd (19993) argues that metaphors are part of theory in use, not merely pre-theoretical postulation. Boyd does not distinguish a phase of metaphorical speculation from one of literal, factual knowledge.

However, Boyd retains the positivist possibility that metaphors are continuously subject to tests of verification and falsification. This occurs, however, not through formulating increasingly precise language that more accurately reflects the objects of its concern, but through better knowledge of the objects themselves. Boyd remarks "… the improvement in linguistic usage resulted from new discoveries about the world, rather than from attention to linguistic rules or conventions" (1993: 523). In effect, Boyd is re-inscribing a positivist distinction between language and objective reality and, thus, a distinction between metaphor and knowledge. Kuhn (1993: 535-536) makes the necessary, if obvious, rejoinder that Boyd's formulation rests on the assumption of a world 'out there', beyond language and theory and knowable apart from them. While Kuhn avoids extreme nominalism—there is a world out there, in his view—it can only be known through thought and language that are organized into paradigms. We cannot know the world except through culturally and historically specific paradigms and these are necessarily infused with metaphors that are meaningful in that context. Metaphor is fundamental to, not parasitic of, scientific thought (Kuhn 1993: 539-541).

Historians of medicine have also documented the longevity and ubiquity of metaphor in conceptualizing the human body and the diseases with which it is afflicted. From Galen to Virchow, the body has been known and described through metaphor (Temkin 1977: 272-277). Nor did 20th Century biology escape the influence of metaphor in formulating its theories (Keller 1995). Reviewing some important metaphors in the history of medicine, Temkin notes that they are not merely a manner of speech, encouraging intrusion of extraneous values and perceptions into 'pure' knowledge (1977: 283). Metaphors are integral to the knowledge they describe. Says Temkin, "The use of metaphors in human biology is not an aberration…metaphor has shaped concepts of human biology" (1977: 283). Tauber, a contemporary immunologist, concurs, "Metaphors in science…. create reality for use" (quoted in Schwartz 1995: 1176) He rejects a distinction between theory and metaphor, arguing

instead that, "Metaphors and theory share an underlying structure and thus their meanings are reciprocal and intimately linked" (quoted in Schwartz 1995: 1176).

Temkin argues that metaphors also link esoteric knowledge with more transcendent frameworks. As he says:

> The realm and nature of human biology is defined by convictions entering from outside. Therefore the language too comes from outside; it is metaphorical…. Metaphor in science may appear to be a kind of indicator for our prevailing convictions (Temkin 1977:283).

By drawing on frameworks beyond the bounds of esoteric knowledge, metaphors inevitably draw on and reflect the social, political, economic and cultural context in which they exist. As such metaphors illuminate the social concerns and cultural values of their settings. As McFague (1982) argues the metaphors operant in any culture are indexes of that cultures' system of knowledge, as well as its values and concerns.

METAPHOR AND THE SOCIOLOGY OF HEALTH AND ILLNESS

One influential wing of the sociology of biomedical knowledge argues that knowledge is socially constructed yet has failed to substantially examine the role of metaphor in that construction. While the history and philosophy of science (Boyd 1993) and the history of medicine (Temkin 1977) have considered the epistemological status of metaphor and its role in the construction of medical knowledge, it has been substantially ignored by the sociology of health and illness. Such an omission is puzzling given the debate over the epistemology of medical knowledge (Wright and Treacher 1982), on the one hand, and the sociological significance of metaphor documented by Sontag (1987), on the other.

Renee Fox is one sociologist who recognizes that biomedical knowledge is an encoded language, translating issues beyond narrowly esoteric, technical ones. As she says:

> …exempting oneself from exploring biological aspects of medicine on the grounds that they fall outside the orbit of sociologically relevant considerations is to overlook some of the important ways in which attitudes, values, beliefs, symbols and myths are coded into the language, concepts, facts and modes of reasoning of the various fields that make up medicine (Fox 1979: 8).

One of the most systematic enquiries into the role of metaphor in biomedical knowledge is that of Emily Martin, an American anthropologist. Martin has scrutinized the place of metaphor in medical knowledge and asks what is presumably a rhetorical question:

> …are there powerful links between the particular metaphors chosen to describe the body scientifically and features of our contemporary society that are related to gender, class and race? (1990: 422).

A refrain that permeates Martin's work is that there are indeed powerful links between metaphor, science and social organization (1989; 1990; 1993). Her early work, *The Woman in the Body* (1989), offered an account of the 'social production of knowledge' through examining the role of metaphor in biomedical knowledge (1989: 5). Her work is an insightful, fastidious exegesis of how economistic, hierarchical metaphors frame historical and contemporary biomedical accounts of menstruation, childbirth and menopause. These metaphors reflect the capitalist division between public and private space, the transformation of knowledge by the scientific revolution, the patriarchal rendering of nature and culture, as well as the capitalist imperative for unfettered production. Reflecting these concerns, the metaphors associated with childbirth render women passive machines engaged in production. By contrast, the metaphors surrounding menstruation and menopause centre on failed production, invoking notions of thwarted output because of atrophy and decay; in markedly pejorative language. Martin observes that bodily processes that are biologically similar to menstruation and that are experienced by both men and women, or by men alone, are not described in flagrantly negative ways. The lining of the stomach is regularly shed in a similar manner to the lining of the uterus; likewise seminal fluid contains debris that has been sloughed off. Yet, observes Martin, that these processes are described in "factual and objective" language (1989:45). Hence, while recognizing the part metaphor plays in formulating medical knowledge, Martin still distinguishes between language that is obviously and overtly metaphorical and that which is "factual and objective".

Given the view that all knowledge is metaphorical, the interesting sociological question is what are the conditions in which some thought is recognized as metaphorical, while other discourse is taken to be literal and factual? A further line of inquiry concerns the sociological significance of this difference.

METAPHOR, EPISTEMOLOGY AND THE SOCIOLOGY OF HEALTH AND ILLNESS

I suggest that the sociology of health and illness has not examined metaphor because dominant positions in the sub-discipline have placed the content of medical knowledge in an epistemological black box. I examine in turn, phenomenological sociological approaches, Marxism, and constructionism and suggest that they deal inadequately with what Wright and Treacher (1982: 1-22) deem "the problem of medical knowledge".[2] A second argument, developed later in chapter is that this situation also stems from sociology traditionally having an instrumentalist, a-symbolic view of knowledge in which study of metaphor could have little place.

Phenomenological approaches

Much of the sociological analysis undertaken in a phenomenological vein has its genesis in the work of Max Weber and his emphasis on *verstehen.* This refers to trying to understand social action by apprehending the viewpoint and motivation of the actors involved. Weber neatly summarized the approach in saying, '…one need not have been Caesar in order to understand Caesar" (Weber 1968: 5). Hence, the meaning of social phenomena for individuals is a crucial element of sociological analysis. However, while Weber made *verstehen* central to his intellectual manoeuvres, his analysis remained pitched at the level of social structures, not at the level of the individual (Gerth and Mills 1970: 57-58). Notwithstanding Weber's structural emphasis, overwhelmingly sociological approaches making *verstehen* central to their epistemology and method have been micro sociological in orientation, often sidelining structural issues.

Such approaches have been most fully developed and expressed in phenomenology, symbolic interactionism and ethnomethodology. All three perspectives share a concern with human consciousness, purposeful action, and uncovering the generation of social order through interaction. While phenomenology aims to uncover the assumptions that underpin and structure the experience of everyday life, ethnomethodology charts the actual methods people

[2] Phenomenological, Marxist and Constructionist approaches were chosen because they are the most fully developed and coherent approaches to medical knowledge. I consider that the work of Foucault falls within the constructionist approach to biomedicine. I did not consider positivism because I do not regard it as a substantive theoretical perspective on how and why medical knowledge is formulated. While feminism is a coherent approach to biomedical knowledge and practice, epistemologically it is derivative from the three perspectives I do consider. Gerhardt (1989) nominates phenomenological and Marxist approaches as significant features of the intellectual history of the sociology of health and illness. She does not however discuss constructionism. Cheek et (1996) also include phenomenological, Marxist and constructionist schools of thought as significant influences in the sub-disciplines development.

use to create social reality. Symbolic interactionism analyses the way social order is created through the meaning individuals attach to people, events and objects. In particular, it focuses on the importance of language and other forms of symbolic communication in creating social order. It is not the place of this thesis to offer either a detailed exegesis or critique of these schools, nor to delineate their similarities and differences. It is sufficient to note that each places subjective understanding and meaningful action at the centre of analytical focus. Further, each perspective, in somewhat different ways, 'builds' social order and structure out of interactive processes, rather than regarding 'society' as an *a priori* entity that moulds social action.

An argument against positivism

Building on the philosophy of Husserl (1965) and Schutz (1972), in particular, phenomenological sociological approaches make an important critique of positivism. They charge that conventional, macro-sociological approaches analyse the social world according to the canons of natural science. That is, they focus on external, 'objective' factors and the (allegedly) determining influence they play on human action. Blumer (1969) disparages this 'variable' analysis, as he terms it, which he regards as typifying the inverted approach of macro sociology. This approach takes some phenomena thought to operate on group life and then examines an aspect of the group it is presumed to effect. Such an approach is essentially a stimulus-response understanding of human action; an independent variable (say, social structure) produces an effect in the dependent variable, human action. These approaches, for Blumer, neglect the capacity of humans to think, to have purposes that guide their action, as well as neglecting their ability to communicate both the intentions and the meaning of their action (Blumer 1969: 131-133). Human beings, phenomenological sociologists assert, are not helpless dupes who respond to external forces in a reactive, unreflective fashion.

Following Schutz (1972), phenomenological sociologists argue that individuals are self-conscious and that their action cannot be understood as merely observable like rocks, or cells, for example. People attach meaning to objects, events and persons and act on that meaning. Meaning does not come from the external world; it is imputed to it. Hence, the external world, the object world, could never determine action, since knowledge of this world is itself constituted through consciousness and interpretation. As Berger and Luckmann say:

> We can never comprehend some putative substratum of consciousness…regardless of whether the object of consciousness is experienced as belonging to an external physical world (1987: 34).

From this standpoint, it is not ‘objective’ phenomena that are important, but the way they are interpreted and hence acted upon. As 'Thomas' theorem' expresses it, "If men (sic) define situations as real, they are real in their consequences" (Thomas 1969: Xl). This inverts the positivist proposition that people gain knowledge through value free observation of objective phenomena. Sociologists working in a phenomenological vein suggest, in contrast, that knowledge of objective phenomenon is interpreted and it is interpretation not the ‘objective’ fact that shapes social action.

Hence, for most phenomenological sociology, meaning does not reside in the object world, but in the way it is subjectively interpreted by people. When applied to the domain of health and illness, the proper focus, according to phenomenological sociologists, is not the ‘objective’ phenomenon of disease, but the way in which it is interpreted and acted upon. Says Gerhardt:

> …phenomenology aims to produce a theory of social systems based on the structure of individuals' experience, what counts are the invariant features of actors meaning construction… Biological processes behind illness…are not mentioned (1989: 191).

Interpretation, not ‘facts’

In line with 'Thomas' theorum', with its insistence on the centrality of subjective definition, the ‘fact’ of disease is less important than the meaning with which it is attributed. Freidson makes the point that to focus on only the biological, or objective, dimension of disease is to miss its crucial sociological significance. As he says:

> While disease may be ‘there’, it is what we, as social beings, think and do about it that determines our lives. Illness as such may be biological but the idea of illness is not (Freidson1970: 209).[3]

From this perspective, it is the nature of the interpretation, not the nature of disease, which is central to the meaning and, therefore, the social action with which it is associated. This should be an entrée into understanding biomedical knowledge as metaphorical. Phenomenological approaches have, rightly, criticized medicine for a myopic focus on the biology of disease, neglecting its meaning for people and the nature of their experience (Kleinman 1988: 17-18;

[3] Freidson distinguishes between medical scientists, who produce the knowledge of biomedicine, and practitioners who apply that knowledge to the problems of particular individuals. The knowledge of medical scientists is the more scientific of the two and is not amenable to sociological investigation, in Freidson’s view. It is this scientific knowledge and its dissemination to future practitioners and the general public that I am considering in this thesis. See Freidson 1970: 169-171.

Good 1994: 117). Parsons (1951: 430) long ago alerted us to the fact that illness is a social state. To regard illness only as a biological phenomenon is to return to a stimulus-response model of human action; altered physiology generates a conditioned behavioural response. This, however, denies the element of definition and interpretation in response to biological signs and symptoms. For instance, consulting a doctor frequently only occurs after extensive consultation with other lay people, who interpret the symptoms as needing medical attention, or not (Turner 1995: 42-44). It is the meaning given to the signs of disease, rather than the disease itself that generates the social action of consultation. The extent to which disease and illness is a social phenomenon can be seen in the way it gives rise to different forms of behaviour in different cultural contexts (Kleinman 1988: 19-20). There are gender and socio-economic differences in the meaning and behaviour associated with illness, and even 'normal' and deviant ways of being ill (Turner 1995: 39-42). It is the social definition of illness that is crucial in shaping these different behaviours, not the biological fact of disease.

Disease and illness

So pervasive is the presumed cleavage between the biomedical focus on the biology of disease and the way it is subjectively experienced and interpreted by the afflicted person, that a distinction has been drawn between the concepts of disease and illness (Susser and Watson 1975: 63; Kleinman 1988: 3-7). Illness belongs to the lifeworld and concerns "…how the sick person and members of the family or wider social network perceive, live with and respond to symptoms and disability" (Kleinman 1998: 3). It is the subjective and meaningful experience of ill health. Disease, by contrast, is the biomedical rendering of human suffering. It is a "…diagnostic entity, an 'it', understood only as biological malfunction" (Kleinman 1988: 5-6).

The refrain underpinning much of both medical and sociological literature on the subject is that disease, defined as a biological condition understood and, usually, treatable by science, is the province of biomedicine. Illness, however, lies within the province of social science, since it relates to lay meanings and subjective experience. Says Misher, "The social meaning of illness falls outside the province of the biological sciences" (1981: 3). However, the usually unstated corollary to this proposition is that biomedical knowledge about disease falls outside the province of the social sciences.

The juxtaposition between illness (subjective experience) and disease (the objective biological condition), however, reinscribes the positivist distinction between fact and value. Disease is rendered a fact, beyond the domain of meaning and interpretation. Sickness, the domain of the

life-world, is the realm where disease acquires meaning and value. This leaves the concept of disease in an epistemological 'black box'. Disease remains in the domain of nature, an objective fact, beyond scrutiny or interpretation. Differentiating illness (the value laden life-world) and disease (the objective anatamo-physical malfunction) leaves biomedical knowledge concerning disease unproblemmatically accepted as factual and objective, and beyond sociological scrutiny. Implicit in the disease / illness dichotomy is the assumption that the lifeworld is social, while disease belongs to the world of 'nature'. Disease exists independent of context or interpretation, " … a case of pneumonia or syphilis is pretty much the same in New York or New Caledonia" (Scheff 1975: 7) The corollary to this assertion of disease as a-social is that biomedical knowledge is likewise a-social. Biomedical knowledge is technical, value free and objective. The meaning of disease resides in the lifeworld, which is a separate domain from that of medicine.

Phenomenological perspectives are useful in alerting us to the rich and complex ways people interpret and structure the experience of ill health (Good 1994: 116-134). They should offer a valuable tool for understanding the place of metaphor in according disease meaning and the way this structures the experience of illness. However, by juxtaposing biomedicine as technical and value free and the social as meaningful and value laden, phenomenological perspectives foreclose on a conceptual space that could allow investigation of metaphors embedded within biomedical knowledge. Metaphor, by definition, is a symbolic enterprise. However reiterating the view that biomedical knowledge is technical and value free, means that the possibility that biomedical knowledge is metaphorically constituted knowledge cannot be considered because of the pervasive tendency to regard technical knowledge as objective and a-symbolic. By this definition, biomedical knowledge is not meaningful; it simply mirrors the workings of nature. The meaning of illness comes from the lifeworld, not from 'nature' and biomedical knowledge of it. Indeed, the charge made most frequently is that medicine, far from being meaningful, leaches meaning from the experience of illness. Kleinman, invoking Weberian terminology, refers to the 'iron cage' of the, "…radically materialist pursuit of the biological mechanism of disease", precluding attention to issues of meaning (1988:9). Phenomenological perspectives separate subject and object domains thus:

Table 1.1: Implications of the separation of the subject and object worlds

Focus	Illness	Disease
Domain	Lifeworld	Medicine
Nature of knowledge	Metaphor	Literal objective knowledge

Marxist sociology

Like phenomenological approaches to health, illness and healing activities, Marxist sociology has charged medicine with being de-humanizing and oppressive (Waitzkin 1989: 220-239; Navarro 1976). However, this is not because of the neglect of the lifeworld but because medicine under capitalism reproduces the de-humanizing and oppressive features of capitalism itself. Marxists criticize approaches utilizing phenomenological frameworks for focussing on:

> … immediate social relationships between individuals and groups in the medical context (and paying) …relatively little attention to the political and economic structure of the medical care system, or to its relationship with the wider society (Doyal and Pennell 1991: 15).

The link between capitalism and patterns of morbidity and mortality has long been noted. In *The condition of the working class in England* (1969), Engels outlined the relationship between capitalism, ill health and injury. He insisted that injury and illness have their origin in forms of social organization, not individual susceptibility, clumsiness or personal failing. The living and working conditions of working people cause injury and ill health. Much of the injury and illness he reported was attributable to the capitalist organization of social life, not merely biological states.

Engels, like contemporary Marxists, insists that it is capitalism, not industrialism and / or urbanization that explain morbidity and mortality (Doyal and Pennell 1991:19-20; Waitzkin 1980: 333-336). In relation to modern health problems and biomedicine, Marxists make two broad claims. The first is that capitalist relations of production continue to generate morbidity and mortality and that working class people bear their weight unequally. The second broad claim is that medicine fulfils important ideological functions, obscuring the real origins of disease (false consciousness) and, by muting worker discontent, maintains support for capitalism (hegemony) (Doyal and Pennell 1991: 35-36 Navarro 1976).

Capitalism and the nature and distribution of disease

Doyal and Pennell, in one of the best and most widely known exegesis of Marxist concepts of health and illness, reject the clichéd slogan that ‘capitalism causes disease’ (1991: 24). For one thing, such a simplistic equation does little to advance an understanding of how capitalism produces morbidity and mortality. Secondly, such a catch all phrase does not aid in

devising a remedy, since in sheeting everything home to a monolithic (and mythologised) capitalism, the problem is located everywhere and the solution nowhere (White 1991: 30). Instead, Doyal and Pennell offer an analysis that focuses on mechanisms, rather than rhetoric. Capitalism contributes to disease and death by sustaining a set of relationships that ensure the continuation of private profit for the bourgeoisie, but which conflicts with the health needs of the mass of the population.

Essentially capitalism creates, "… a contradiction between health and profit" (Doyal and Pennell 1991: 25). The process of commodity production gives rise to distinctive patterns of illness and injury, depending on what is produced and the manner of its production (Doyal and Pennell 1991: 66-72. Many productive processes utilize, or produce, dangerous chemicals or toxins; mercury or radiation, for example (Doyal and Pennell 1991: 67-68; Waitzkin 1980: 353). Other forms of work involve unsafe practices, such as mining or farming (Doyal and Pennell 1991 69-70; Waitzkin 1980: 351-353). Moreover, the way work is structured is often harmful for workers: routines that are monotonous, involve tight control of workers and that de-skills them, creates psychological hazards for those involved (Doyal and Pennell 1991:73-74; Tesh 1990: 105-130). However, it is not just the direct' effects of productive process that are hazardous for workers. Many dangerous substances encountered by workers find their way into homes and neighbourhoods, thus affecting their families and fellow residents. This may range from the unwitting transport of things such as asbestos fibres or damaged sperm (Doyal and Pennell 1991: 75-77).

However, production is not the only culprit in the unequal burden of suffering, capitalism typically generates inequalities in consumption that have negative consequences for health status. Working class people are more likely to consume cigarettes and alcohol than their middle class counterparts. However, working class people are less likely to consume a healthy diet than those who are better off. Both of these factors play a role in class related patterns of morbidity and mortality. (Doyal and Pennell 1991:80-92).

Capitalism and medical knowledge

The second broad strand of Marxist analyses of health under capitalism relates to medicine's ideological role. Doyal and Pennell agree with most other Marxist commentators that making changes to the medical profession—by either having different recruits or changing their education and training, or by altering the mode of delivering health care—will not alter its fundamental character (White 1991: 38-39; Navarro 1983: 185). As Navarro expresses it,

"…medicine is always articulated within a specific mode of production" (1983: 184). Consequently, medicine under capitalism is capitalist medicine and will, ineluctably, bear the imprint of capitalism. Changing medicine would require changing capitalism (Navarro 1983: 187).

To understand the ideological function of medicine requires, according to Doyal and Pennell, analysis of the 'knowledge base of science' and the social practice of that science. Such an analysis would ask questions such as, who practices the science, using what kinds of technology, in what kind of division of labour and with what funding base? It is also necessary to relate the knowledge and the social practice to the social context in which they are formed and applied. This element of analysis focuses on issues such as how the knowledge and practice contributes to capital accumulation, how both become commodified and the role they play in generating and reproducing ideology (Doyal and Pennell 1991:22). Such a research program is a good one because it apparently offers a way to consider the content of biomedical knowledge, not just its application (Short 1994: 227-230).

Medicine is not, as positivists hold, an objective body of knowledge, or set of practices, that is developed in a vacuum; it bears the imprint of the context in which it is formulated. Contemporary medicine has its roots in the scientific revolution of the 17th Century (Jewson 1976: 225-244). During this time, science moved from trying to understand the natural world to attempting to control it. In tandem with this change, the body was re-defined as a machine that could be manipulated in line with mechanical principles. Medical thought and practice underwent further changes, reflecting the different modes of production in which it was formulated. Bedside medicine, prevailing until the later part of the 18th Century, had a patient centred focus: both the illness and treatment were located in the wider context of the sufferer's life. The creation of the modern hospital, as a consequence of urbanization and democracy (Foucault 1972), transformed by now a largely poor client population from 'patients' to 'cases'. Accordingly, medical attention shifted from a set of symptoms and their place in an individual's life to diagnosis of objective malfunction and the classification of disease. What a person said about their complaint was increasingly less significant than what the clinician could see or hear. Finally, with the developing interest in public health and the identification of 'germs' and cells, reductionism triumphed. The laboratory, even more than the hospital clinic, became the foundation of medical knowledge and practice (Jewson 1976: 225-244).

Medicine and ideology

What are the central tenets of contemporary medical thought and practice from a Marxist perspective? Firstly, illness is defined almost exclusively by the presence of objective pathology. In the absence of objective pathology, there is no disease; hence subjective evaluations of health and illness fall beyond the pale of scientific medicine. Medicine, in this sense, not only controls who may be deemed ill, it controls people's expectations of what constitutes health and illness (Doyal and Pennell 1991: 34-36). The emphasis on discrete, localized pathology located in individual bodies has two consequences. The first is that illness is presumed to be primarily a biological phenomenon. It derives from discrete entities—a germ, a toxin, a malfunctioning organ—and it effects discrete entities; a cell, organ, or system. A second, and related, consequence is that illness is individualized. Illness is presumed to affect the bodies of individuals and, overwhelmingly, the cause is presumed to be the individual's responsibility. Moreover, the solution lies in intervening in that individual's body and in them making ‘life style’ changes, if necessary (Doyal and Pennell 1991: 34-36; Waitzkin 1989: 231-233).

This ‘biological individualism’ has two further important social functions (Harrison 1985: 498-499). By defining disease as a biological phenomenon, medicine legitimates its own claim to be the profession charged with dealing with it, based on its scientific understanding of anatomy and biology. As Doyal and Pennell put it "… scientific medicine (is presumed to) provide the only viable means for mediating people and disease" (1991:12). In consequence of this assumption, medicine is the social group accorded control of the population of the ill. It is ironic that Marxist scholars agree with Parsons (1951: 434-439) that the medical profession is centrally concerned with social control (Doyal and Pennell 1991:16; Waitzkin 1989: 225-228). Medicine has ‘legitimate’ control to deem who is ill, whether or not they may be exempt from normal social obligations, (principally employment), the period of their exemption and when they are again able to return to normal function. The salient difference is, of course, that while Parson's (1951) approves this role, Marxists do not.

Marxists refusal to concede the legitimacy of medicine's power in the exercise of social control points to their second general charge against medicine; that it acts as an ideological buttress of capitalism. By defining illness as both biological and individual, its origins in capitalist relations of production remain obscured. Illness and injury are events belonging in ‘nature’, not the structure of capitalism. According to Figlio, a medical diagnosis, "…confirms the prevalent view that what has happened … is of the same form as all the other

things in nature" (Figlio 1985: 129). This biological understanding of illness de-politicizes it and diverts attention from the structures that produce it. Say Doyal and Pennell:

> The destruction of health is potentially a vitally important political issue, and the medical emphasis on individual causation is one means of defusing this (1991:35).

How and why should medicine be able to function in this way? We return to Navarro's point that within a capitalist framework, medicine is capitalist medicine. This, at first blush, seems to provide a good program for developing an analysis of medical knowledge by insisting that it is only understandable within a given context. However, that context is capitalism, usually understood in economically determinist ways that render all social phenomena understandable and explainable by the workings of the economy (White 1991:30; Collyer 1992:3). From this perspective, medicine does not act as medicine, *per se,* but as an agent of capitalist relations of production. Doyal and Pennell articulate this logic:

> The function of modern medical organizations and the mode of production of health care are to a large extent determined outside the health sector. In large part, they are a reflection of the need of a capitalist system to sustain a particular set of social and economic relationships within the spheres of production and consumption…(1991:19).

As White (1991:30) and Collyer (1992) point out, this kind of logic proceeds from rendering economic imperatives the cause of all other phenomena. When this logic is applied to the concrete domain of medicine it severely limits medicine's power to exercise any autonomy as a profession (White 1991: 30; Collyer 1992: 3). In Navarro's view (1983: 185-187), the power of medical profession stems, not from the way medicine is organized, but its place in capitalist relations of production. Medicine is dominated by the bourgeoisie and medical knowledge grows under the aegis of the dominant ideology. As Wright and Treacher (1982: 11) point out, to reduce medicine to a passive reflection of capitalism obscures the basis of its ideological power. What requires explanation, they argue, is the way medicine contributes to dominant ideologies, but does so as medicine, apparently distinct and distant from other social institutions. Collyer (1992: 1-10) gives the point about medicine's autonomy as a social institution empirical weight. Using the example of the cochlear implant, she shows that far from acting as mere puppets of the capitalist imperative to accumulate profit, the medical profession placed limits on the dispersion of the implants. This shows the profession acting

autonomously, in its own interests, not as a dupe of capitalism and acting in line with its own definition of itself as an autonomous profession with its own edicts and standards.

Despite Doyal's and Pennell's agenda of analysing the knowledge base of science, and relating it to its practice and the context in which that occurs, they largely exempt the content of medical knowledge from their analysis. As White suggests (1991: 44-48), like most Marxists, Doyal and Pennell, begin and end their analysis by unproblematically utilizing the biological categories designated by medicine. The concept of disease as defined by biomedicine is left virtually intact. The substance of Doyal and Pennell's analysis does not render medical understanding of disease problematic, or open it to sociological scrutiny. Their charge is not that medical understanding of disease is problemmatic but that it veils understanding of diseases' true cause. Disease is still disease, as defined by biomedicine, but is socially produced rather than simply being attributable to biological factors (1991: 49-95). For example, the biomedical understanding of tuberculosis as due to infection with the tubercle bacillus is left unexamined and the concept of tuberculosis remains stable over time and in different cultural settings (Doyal and Pennell 1991: 55 and 119). Where biomedicine gets it wrong, according to Doyal and Pennell, is in failing to acknowledge how social conditions influence exposure and susceptibility to the bacillus. The bacillus itself, however, remains an objective fact of nature, suggesting that the biological realm remains an objective fact, beyond culture.

Marxist thought reinscribes the following distinctions:

Table 1.2: Disease and disease causation

Focus	Biological fact of disease	Cause of disease
Domain	Biology	Relations of Production
Nature of knowledge	Biomedical	Marxist

Marxists approaches thus, like phenomenological ones, reinscribe a positivist approach to medical knowledge. While Marxist analyses offer a valuable analysis of health inequalities and of the practice of medicine, they largely ignore the content of medical knowledge. Like phenomenology there is little conceptual space within Marxist approaches to consider the metaphorical content of medical thought while that thought is regarded as an objective truth mirroring objective nature.

Constructionism

Most strands in the sociology of health and illness have investigated the consequences of the application of medical knowledge, especially its role in social control (Parsons 1951; Doyal and Pennell 1991). These range from early, micro-sociological analyses of the role of medical knowledge and practice in 'labelling' individual identity and behaviour, through to some Marxist and feminist interpretations of medical knowledge as mere ideology of capitalism or patriarchy (Gerhardt 1989; Cheek et al 1996). Freidson (1970) was an early pioneer in exposing how control of knowledge was an integral strategy in gaining and maintaining medical dominance.

Constructionism continues this interest in professional dominance and in the social consequences of medical thought in practice. However, it extends these earlier approaches by examining the importance of the content of medical knowledge. This allows analysis of the way in which medical knowledge contributes to medical power. But it can only do this if it accords medical knowledge some theoretical and empirical autonomy. Considerable debate exists about the intellectual origins of constructionism. For some commentators, the work of Foucault is a central underpinning (White 1991; White 2002; Short 1994). Marxism is acknowledged by others to be an important precursor (Figlio 1982). Wright and Treacher (1982: 14), together with White (1991), identify a certain kind of feminist analysis as a well-spring. Pickering (1992: 1-8); Jordanova (1995: 363-367) and Bartley (1990: 371-373) agree that the philosophy and sociology of science were important in creating an epistemological space in which a constructionist account of medical knowledge could emerge. Finally, Gerhardt (1989), Short (1994) and Cheek et al (1996) argue that phenomenological accounts of medical knowledge and practice were also direct forerunners. The diversity of influence on constructionism is important in evaluating its status and contribution. Whatever status it may have acquired as a 'school', to the extent that it draws on these heritages it reinscribes many of their strengths and weaknesses.

Wright and Treacher, (1982: 3-5) made one of the earliest attempts to codify premises fundamental to a constructionist critique of positivism. Their summation remains valuable because it encapsulates the epistemological bases of constructionism. Firstly, medical knowledge should not be unproblematically accepted as the immutable truth about our bodies and the ailments that afflict them (Wright and Treacher 1982: 4). This not only rejects positivist epistemology, it implies that medical knowledge will, to some extent, bear the imprint of the setting in which it arises. If nature does not directly determine knowledge,

social and cultural forces must play some part in its constitution. A second challenge questions the conventional wisdom that medical knowledge is true because it is based on science and because it is, ostensibly, efficacious. The optimism of earlier eras in the true and cumulative nature of medical knowledge has become more difficult to sustain as the intractable nature of many contemporary ills has become apparent. (Turner 1995: 206; Rosenberg 1992: 309) Further, 'medicalization', the increasing identification of social or moral problems as technical ones amenable to technical intervention by medicine, is increasingly regarded, in some quarters, with ambivalence, rather than as a sign of triumph. (Rosenberg 1992, 309; Kleinman 1988: 26-28).[4]

Third, Wright and Treacher also noted that the assumption that diseases existed 'in nature' was increasingly coming under critical scrutiny (1982: 4). Early interactionist accounts, for example, though concerned with the social dimensions of illness, held that it rested on a physical substratum that was not amenable to sociological analyses (Gerhardt 1989: 83-90). This dualism is untenable, according to constructionism; since ways of conceptualizing nature and disease are themselves socially produced narratives. As White argues, medical knowledge is not a mirror on nature (1991: 2). Fourthly, Wright and Treacher suggested that the belief that medicine and the social were separate and autonomous domains was no longer tenable. Medical knowledge and practice, no less than any other thought and activity, is shaped and permeated by the social setting in which it exists. Medical knowledge is simultaneously social knowledge (Wright and Treacher 1982: 5).

Wright and Treacher's (1982) essay helped clarify the terms of the debate and make it central to the sociology of health and illness. Yet, their treatment of the meaning of diseases is thinly textured and leaves the domain of culture virtually untouched. Medical knowledge, they concede, ought be regarded as one form of culture. However, they claim that analyses that proceed from this basis typically ignore, or underestimate, the political relations that sustain medicine and the ideological ends that it often serves (1982: 13). Implicitly, this renders culture the 'poor cousin' of economic and political forces; this tends to emphasize the use rather than the content of medical knowledge.

[4] Fox (1979: 477-483) discerns trends that have inaugurated, or may do so, something of a demedicalization of (American) society. While there is much to commend this analysis, there is little doubt that many behaviours and social situations remain medicalized. The Human Genome Project and the promises it has spawned to find genetic bases for phenomena as diverse as obesity, aggression and homosexuality suggests that medical accounts will be offered as explanations for behaviour and social situations for some time to come.

The social interest stream

Traditionally, constructionist analyses of scientific and medical knowledge have fallen into two broad theoretical and methodological strands; the ‘laboratory studies’ strand, which will be discussed later, and the ‘social interest’ model (Bartley 1990: 374-380; Jordanova 1995: 361-375). The ‘social interest’ stream in constructionism has concentrated on the relationship between knowledge and aspects of the wider social structure. The theoretical lineages of this wing have been Marxist, Critical Theory and Feminist explorations of health, illness and medicine. (Bartley 1990; Jordanova 1995). Medical knowledge, from this premise, is not a technical, value free or a-social tale of truth about nature, bodies, or human affliction. Biomedical thought is too inevitably entangled with values, beliefs and interests to sustain the positivist dictum that it is a ‘pure’ enterprise. As those identifying their work as constructionist have shown, medical knowledge is not stable, irrefutable or unassailable. It is variable, according to training, intellectual orientation and institutional affiliation. Differing and competing knowledge about the pathogenesis of multiple sclerosis, for example, are best accounted for by such factors (Nicolson and McLaughlin 1988). The formulation of disease categories is firmly embedded in class relations, notably conflicts between capital and labour. (Figlio 1982; 1985). Nor can biomedical thought be disentangled from stereotypes about gender and the social relations between genders (Martin 1989). Indeed, biomedical knowledge is central to control and regulation of both individuals and populations (Foucault 1973; Turner 1995). These accounts are useful for the challenge they provide to the epistemological privilege accorded medical knowledge. Further, they are instructive illustrations of the fact that medical thought is not hermetically sealed off from the context in which it is formulated and applied. Both these insights are pre-requisites for understanding the meanings that crystallize around disease.

Constructionism is useful in providing some understanding of how knowledge is produced, by whom and in what circumstances, as well as exposing who benefits and who is, potentially, disempowered by the given construction of a disease. However, two caveats apply to this emphasis. The first is that social interest approaches treat culture in such a reductive way that the meanings of disease are rendered no more than a reflection of power relationships. The meanings of disease, expressed in metaphor, are not reducible, in any direct way, to the interests of particular groups, however. Rosenberg (1992: 307) contends that this arm of constructionism can produce functionalist analyses or ever-emphasize the extent of arbitrariness in the construction of disease. Jordanova concludes, "All too easily the result of giving priority to interests is mechanistic explanations” (1995: 370). The second proviso

regarding the social interest stream is a more general elaboration of the first; that is, that it privileges politico-economic factors over cultural ones. Thus far, it has contributed little to cultural analysis of disease and the meanings associated with them. Typically, issues of meaning have been reduced to disputes about whether diseases are ‘discovered’ or ‘fabricated’ (White 1991; Rosenberg 1992: 259-260). It is not necessary to belittle this debate to suggest that it is a starting, rather than an end, point for inquiring into the cultural influences on the meaning of disease.

Laboratory based studies

The second tradition in constructionism typically involves small-scale, studies of aspects of laboratory life, focusing particularly on the micro processes of knowledge formation; how is knowledge generated, sustained or challenged in this particular context? (Bartley 1990; Pickering 1992, 1-12) Theoretically, this strand owes much to phenomenology, interactionism and ethnomethodology. Central to these traditions is a concern with the subjective perception, definition and creation of reality, often focusing on the lifeworld of the laboratory and the way in which scientific knowledge is constructed in that setting. To focus on the way individuals interpret, negotiate and construct reality may seem a promising lead into the processes through which meanings are imputed to disease and the diseased.

While such perspectives are useful in examining subjective interpretation and definition in the construction of particular realities associated with disease and illness, they cannot overcome methodological individualism to examine the structured nature of this exercise in symbolic reasoning. Given that metaphor both expresses and constitutes symbolism about disease, but is located within a coherent and wider conceptual framework, merely taking individual interpretations, in isolation, as a means of examining the meaning of diseases is a theoretically inadequate approach. The power of disease metaphors suggests that the meaning of disease, far from being an inter-subjective achievement, is a social fact.

Social facts, as explicated by Durkheim, have three salient features. Not only is their origin supra-individual, they constrain and constitute individual conduct. Finally, they are general, being diffused throughout society, acting, to greater or lesser extents, on its members Durkheim (1982: 50-59). Sontag (1987) documented the way the meaning of cancer exists as a social fact. Cancers' meaning pre-exists those afflicted with it and is central in structuring their experience of this ailment. Moreover, its meaning is general. Sontag found it expressed in literature, film, biomedical rhetoric and, even, in state policy. Even though Sontag disputes

the dominant meanings imputed to cancer, the fact that she has had to campaign so vigorously to challenge them is itself testimony to their power.

Rosenberg does not question the value of constructionism, as much as he suggests that it has achieved the status of a platitude:

> Much has been written during the past two decades about the social construction of illness. But in an important sense this is no more than a tautology, a specialized restatement of the truism that men and women construct themselves culturally. Every aspect of human identity is constructed - and thus also is disease (1992: 306).

Certainly the most engaging and productive debate in the recent sociology of health and illness has been between constructionists and positivists. Rosenberg (1992), however, implies that the contest has been settled. Scholarship need now not trumpet constructionism, but find ways to refine and extend its insights into disease and biomedical musing and pronouncement on that topic.

BIOMEDICINE AS COSMOLOGY

One way of examining the meaning of disease, constituted and expressed in metaphor, is to regard biomedical knowledge as inherently meaningful and as cosmological. That is, to regard biomedicine as a framework through which key aspects of existence are ordered and made meaningful. Sociology has genuflected to the idea that medicine can be studied as a symbolic system like religion, yet has largely failed to take up this vocation. White (1991:1-2), for instance, acknowledges that medicine is a cosmology, replacing religion as the arbiter of the relationship between nature and culture, on the one hand, and of the individual to society, on the other. Turner agrees that medicine has usurped religion in regulating, disciplining and controlling our bodies, both individually and collectively. He stresses the essentially religious nature of this constraint by suggesting that it is merely a secular form of the traditional Christian requirement that the flesh be mastered to facilitate spiritual development (1995: 19-20). Fox also acknowledges and explores the intertwining of medicine, science, religion and magic (1979: 9).

For the most part, however, sociology has failed to examine the symbolic and religious dimensions of biomedicine. In part, this stems from its inadequacy in theorizing culture, usually treating it reductively: as mere epiphenomenon (Alexander 1990a). Sociology, by and

large, has tended to focus its analysis on 'objective', instrumental structures, such as the economy, the polity or other social institutions (Giddens 1988: 15-17). When applied to the sociology of health and illness, this lopsided perspective has left important areas relatively neglected. Fox (1979: 423) for example, suggests that the dominant tendency of medical sociologists to work within 'social structural or social organizational' perspectives rather than within a cultural one in part explains the sociological neglect of issues related to 'bioethics', that is with existential and religious issues about being human. If the dominant tradition of studying the instrumental dimensions of society and social life has vitiated the discipline's capacity to theorize culture and cultural issues in biomedicine in satisfactory ways, it has left the possibility of analysing symbolism even more stunted (Alexander 1990a: 1). Approaches to culture, emphasizing the profound place of symbolic structures and processes, flourish in other disciplines while, "Sociology … remains mired in pre-symbolic thought" (Alexander 1990a:1).

Despite embryonic recognition of the religious dimensions of biomedicine, of its permeation by symbolic conceptual systems, this agenda remains the runt of sociology's theoretical litter. This failure is due to the dominance of Weberian perspectives on rationalization and disenchantment and the relative neglect of the later parts of Durkheim's work. I will discuss the Weberian legacy before canvassing the potential of Durkheim's later work.

RATIONALIZATION, DISENCHANTMENT AND SECULARIZATION

Weber's view of rationalization and disenchantment displacing religion to a specialized and somewhat marginal life sphere has been a dominant perspective on modernization and secularization. For Weber, science was an important expression of the hegemony of instrumental rationality. By explaining things previously considered 'mysterious', science leaches the meaning from the natural and social worlds and makes religion marginal or residual (Shilling and Mellor 2001: 76). Furthermore, in Weber's assessment, science and religion were virtually antithetical and science had no relationship to issues of meaning. Of science, Weber asks, "Who still believes that the findings of astronomy, biology, physics or chemistry could teach us anything about the meaning of the world?" (Weber 1970: 142). That science, including its expression in biomedicine, could be considered a secular religion inspires incredulity on Weber's part:

> And finally, science as a way 'to God'? Science, this specifically irreligious power? That science today is irreligious no one will doubt

> in his innermost being, even if he will not admit it to himself (Weber 1970: 142).

Weber's work has had two important intellectual legacies. One is a tradition that ties rationalization and disenchantment in with the death or loss of meaning. Alexander points out that Weber's insistence on the death of meaning has made it difficult to study culture as a meaningful order (1990b:189). Marx and Engels offer an early example of this 'loss of meaning' sensibility:

> The bourgeoisie…has put an end to all feudal, patriarchal, idyllic relations. It has pitilessly torn asunder the motley feudal ties that bound man to his "natural superiors", and has left remaining no other nexus between man and man (sic) than naked self-interest…It has drowned the most heavenly ecstasies of religious fervour…The bourgeoisie has torn away from the family its sentimental veil…All that is solid melts into air, all that is holy is profaned…(1970: 35-37).

Given this kind of assessment of modernist society, how would it possible to even consider its religious dimensions? The possibility of religious ideas, values or sentiments would seem to be impossible in a society so putatively devoid of meaning or transcendence, dominated instead by the economy and the polity. It is a tradition much sociological theory has accepted and promulgated.

The second theoretical consequence of Weber's view on rationalization has been its resonance with the secularization thesis that considers religion is less powerful as a worldview and is increasingly confined to the periphery of social life. While it is true that widespread adherence to formal, religious beliefs has declined and the institutional church has lost much of its social power, rationalization and disenchantment are not synonyms for secularization. A decline in the social power of institutional religion and a decreased number of adherents does not automatically entail a loss of mystery and meaning in the world. The Weberian legacy suggests that more complete and certain knowledge displaces religion. However, Durkheim pointed out that the genesis of religion is in irrational or a-rational domains of life that are little touched by the claims of expanding scientific knowledge. (Chadwick 1990: 1-18). From this perspective, the relationship between religion and increasing scientific knowledge is indeterminate. The concept of secular religion, discussed later in the thesis, keeps open the possibility of meaning and mystery still existing in contemporary life though in forms other than traditional religion.

ANTHROPOLOGICAL APPROACHES TO MEDICINE AND MEANING

Anthropology has considered culture as a relatively autonomous domain of social life, taking seriously the structure of symbolism it houses. Traditionally, there has been a division of labour between anthropology and sociology; with anthropology considering culture (including its symbolic and religious dimensions) while sociology has focused on the instrumental aspects of society (Comaroff 1982; Lock and Scheper-Hughes 1990: 47-52). While anthropology has considered healing systems as quasi-religious systems, drawing on and perpetuating a powerful repertoire of symbols, it has tended to focus on exotic cultures. Moreover, even when it focuses on 'Western' biomedicine, it has tended to ignore the political and economic dimensions of biomedical thought and practice. Sociology has focused on issues of political economy but has virtually failed to consider the meaningful dimensions of biomedicine, except in the limited domain of phenomenology (Lock and Scheper-Hughes 1990: 47-52). The following table encapsulates the difference:

Table 1.3: The intellectual division of labour between anthropology and sociology

Discipline	Anthropology	Sociology
Domain	Culture	Society
Focus	Symbolism	Rationalization

One practical consequence of the analytical neglect of symbolic systems by sociology is that it has produced one-sided accounts of the constitution and consequences of the application of biomedical knowledge. Comaroff notes an intellectual division of labour demarcating study of "…social utility from symbolic representation and social interest from cultural form" (1982: 64). This bifurcation of social utility and social interest, on the one hand, and symbolic representation and cultural form, on the other, is at the heart of the relative neglect of the metaphorical structuring of biomedical knowledge. Comaroff shares Alexander's (1990a) complaint that the study of symbolic structures and processes is a lacuna within sociological analyses. In her view:

> …modern sociology is not really concerned with meaning as unconscious logical order. It has thus not contributed much to any aspect of the study of Western symbolic systems (1982: 50).

Like Alexander (1990a: 1-21) and Jordanova (1995), Comaroff suggests that the dominance of viewing biomedical knowledge as merely ideological is largely to blame for neglect in attending to its symbolic dimensions (1982: 50). The focus on ideology accentuates emphasis on the control of medical knowledge rather than its constitution and content. Why is it necessary to consider the content as well as the control and consequences of biomedical

knowledge? Or, to frame the question in different terminology, why do the symbolic and ideological dimensions of biomedical knowledge require analysis? In Comaroff's view, it is precisely the confluence of the control and the content of biomedical knowledge that requires analysis, if both its symbolic and ideological dimensions are to be understood (1982: 50).

COMAROFF: SYMBOL AND IDEOLOGY

Comaroff's essay (1982: 49-68) laid out an agenda for studying medicine as both a symbolic system and as an ideological force and offers a program that provides rapprochement of these two approaches. The program advocated by Comaroff (1982) draws on the strengths of both the anthropological and the sociological orientations, providing a comprehensive way to understand the power of contemporary biomedicine.

Comaroff points out that illness has a strong symbolic dimension because it makes manifest universal paradoxes of human existence and that all healing is an attempt to restore order, potentially threatened by the eruption of these paradoxes (1982: 51). Illness, in whatever context it occurs, raises profound existential questions concerning meaning, fate, responsibility and the nature of being. Healing is about trying to restore an ordered view of the world, challenged by illness' questions, as much as it is about aiding an individual body. As Comaroff says:

> … healers everywhere manipulate symbolic media which identify physical with social order…healing processes powerfully reinforce the cogency of inherent meanings and of implicit images of self and its context drawn from the wider cultural system (1982: 51).

Fox (1979) not only agrees that disease, illness and attempts to heal them are universal phenomena but suggests that even in contemporary, 'modern' societies, medicine cannot be considered in isolation from the entire constellation of society, in both its symbolic and instrumental dimensions:

> …in all societies, health, illness and medicine constitute a nexus of great symbolic as well as structural importance, involving and interconnecting biological, social and psychological, and cultural systems of action (Fox 1979: 472).

The tendency to regard biomedicine as mere ideology ignores or trivializes the cosmological and symbolic aspects of the impact of illness, as well as attempts to heal, and it veils the

issues raised about the nature of personhood and the universe in which it is experienced. In so doing, it fails to capture one crucial and largely symbolic element of what makes illness and healing so compelling, personally, socially and intellectually. To deem biomedicine, one form of healing system, only an instrumental institution, serving particular interests, leaves the largely unarticulated symbolic and moral bases of its power unexamined. Biomedicine cannot meaningfully be extricated from the existential and moral dimensions of life. To understand the way biomedicine addresses the paradoxes and the moral imperatives of life and its 'ponderable imponderables', it is necessary to know how it explains the nature of persons, the responsibility for illness, its nature and the basis for its attempts at healing. In effect, it is necessary to know how medicine defines the meaning of illness. That is, its knowledge content and its symbolic structures must be considered.

Notwithstanding the universal existential aspects of illness and attempts at healing, both occur within particular historical and cultural milieux. To argue that biomedicine, no less than any healing system, is ingrained with symbolic and moral elements does not contradict, or vitiate, claims that it is a powerful social institution sustaining power relationships and serving vested interests; an argument familiar enough to sociological audiences to need no exegesis. Hence the control of medical knowledge and the economic, political and ideological consequences of its application must also figure on an informed theoretical itinerary. In Comaroff's view:

> … the manner in which social interest becomes seamlessly incorporated in the set of tacit assumptions about reality is the key to the social significance of knowledge. This requires that we explore how interests become associated with the symbolic forms which give shape and coherence to our system of implicit knowledge itself…we might examine both the symbolic structure of ideological substance and the ideological motivation of symbolic form (1982: 50).

Deborah Gordon, not coincidentally also an anthropologist, makes a similar observation in arguing that biomedical knowledge and practice draws, "…upon a background of tacit understandings that extend far beyond medical boundaries" (1988: 19). Medicine, says Gordon, asserts a dominant symbolic reality resting on a, "…hidden cultural scaffolding…." (1988: 20). In an essay both comprehensive and astute, Gordon demonstrates the way biomedicine rests on and perpetuates claims about cosmology, ontology, epistemology, notions of personhood, morality and society, as well as religion, especially in asserting a distinction between sacred and profane (1988:19). In so doing, medicine also grounds and sustains a powerful political ideology (Gordon 1988: 19-24). However, to fail to acknowledge

and analyze the powerful symbolic dimensions of biomedical thought is to fail to recognize one important source of its social power. Wright's and Treacher's (1982) point that to understand the social role of biomedicine requires analysing how its knowledge is generated, how it is regarded, received and acted upon; that is, how it fits with the culture in which it exists. For example, how is that biomedicine is regarded by many as a more credible and legitimate authority on what is ‘natural’ than is the Church? As Turner (1995:18-36) notes much of what was once called ‘sin’ or deviance, homosexuality or alcoholism for example, was redefined as illness by biomedicine. Fox refers to this change as the ‘sin to crime to sickness’ evolution (1979: 468). Why should this change have occurred? Why does a biomedical definition of ‘brain death’, rather than a theological doctrine on the soul, satisfy courts and legislators? A satisfactory answer to such a question requires understanding the symbolic resonance of the concept of 'nature' and ‘personhood’ and how the technical knowledge of biomedicine aligns with these.

By and large, constructionism has not taken up Comaroff's (1982) injunction to analyse the symbolic dimensions of more explicit patterns of cognitive knowledge. One important way in which constructionism could extend its analysis is to consider the symbolic dimensions of the knowledge associated with disease and the diseased. Over five decades ago, Parsons (1951) gave us the almost revolutionary insight that illness is deviant. Not all diseases, however, are equal in what should be a democracy of deviance. Different diseases have different symbolic freight and neither wing of constructionism offers a convincing account of these differences. Why, for instance, has the U.S. government declared war on cancer, but not on diabetes? Why is cancer reviled as corrupt and polluting, while coronary heart disease (CHD) is regarded as a ‘clean’, mechanical ailment? (Sontag 1987; Edwards 1994a). Why is cancer shameful, while CHD is emblematic of productive, public sector activity? (Edwards 1994b). How can the fact that CHD is discussed in ostensibly literal terms, while cancer is obviously characterized by metaphor, best be explained?

A constructionism which took Wright and Treacher's (1982) four premises seriously, but which did not treat the domain of culture as an inter-subjective creation, on the one hand, or as passive reflection of politico-economic forces, on the other, can begin to investigate the meaning of disease. One illuminating mode of analysing meaning is to examine metaphor. As Kirmayer (1988: 57) puts it, metaphor is a central means by which values and meanings are ‘smuggled’ into biomedical knowledge. Chapter Two outlines an approach for understanding knowledge as meaningful by examining the theoretical framework Durkheim developed in *The Elementary Forms of the Religious Life.*

Chapter 2

Durkheim: cosmology, symbolism and ideology

Religion sets itself to translate these realities (nature, people and society) into an intelligible language which does not differ in nature from that employed by science; the attempt is made by both to connect things with each other, to establish internal relations between them, to classify them and to systematize them…the essential ideas of scientific logic are of religious origin…both pursue the same ends (Durkheim [1915]; 1965).

Durkheim's theory of the sacred is a theory of how knowledge of the universe is socially constructed. The known universe is the product of human conventions and so is the idea of God, as its ultimate point of appeal…men (sic) create their entire knowledge of their universe…but having tacitly colluded to set up their awesome cosmos, the initial convention is buried…For unless the sacred beings are credited with autonomous existence, their coercive power is weakened and with it the fragile social agreement (Mary Douglas 1975).

RE-INTRODUCING DURKHEIM

The quotations above encapsulate the key themes of this chapter. Durkheim argues in *The Elementary Forms of the Religious Life* that science, like religion, is a cosmology. Therefore, by extension, biomedicine may be considered a secular religion, upholding a distinction between sacred and profane. What is sacred, as Mary Douglas (1975) asserts, is the knowledge base of any given society, including the order it sustains, the structure of relationships existing within it and the values it celebrates. Of the founding theorists of sociology, Durkheim did consider the place of religion in contemporary life and the place of symbolism in sustaining religion and social life generally. However, it was only in the later stages of his work that this field of inquiry was tended. The foundations laid out in *The Elementary Forms of the Religious Life* were developed in later works that were not published in his lifetime and hence remained largely unnoticed. The elements of the Durkheimian legacy that have been most fully developed and publicised are his early works; the proto-quantitative methods outlined in *Suicide* and the sweeping functionalism of *The Division of Labour in Society.* It is these works for which Durkheim is best known and Collins concludes, on that basis; "… of the great, classic figures of sociology, at the present time, Durkheim's reputation is the lowest" (1990: 107).

Stedman-Jones points out that particular disciplines and theoretical perspectives have a version of Durkheim they delight in celebrating or denigrating. Anthropology ties him to Radcliffe Brown's rigid functionalism, while sociology has allied him with a Parsonian emphasis on norms and values (Stedman-Jones 2001: V111-X). There is an old joke that sociologists consider the functionalist and proto quantitative *Suicide* Durkheim's greatest work, while anthropologists give that honour to *The Elementary Forms of the Religious Life*, devoted as it is to the place of symbolism and religion (Smith and Alexander 1996: 585). Phenomenology and affiliated perspectives arraign Durkheim as the high priest of positivism, while more radical sociologists, such as Gouldner, charge him with a-historical, uncritical thought. (Stedman-Jones 2001: V11-1X). Likewise, Lukes observes that Durkheim has been accused of being a number of mutually contradictory things, idealist and materialist, socialist and conservative, rationalist and irrationalist (1988: 2-3). So much from one sociologist! It is not my purpose to adjudicate these competing claims. However, I suggest that Durkheim's view of religion provides a useful framework for analysing science and medicine. I will now outline some of the key elements of Durkheim's theory of religion.

Homology of science and religion

Whatever the debate over Durkheim's intellectual orientation, it is clear that one of his greatest legacies is his counterpoise to Weber's (1970) proposition that science and religion are distinct and increasingly distant life spheres. For Durkheim, they are intimately related: "…the fundamental categories of our thought, and therefore of science, are of religious origin" (Durkheim [1915] 1965: 477). Science, far from being distinct from religion, arises from it; "…nearly all the great social institutions have been religious in origin" (Durkheim [1915] 1965: 466). Not only is science emergent from religion, both are structured by similar ideas and seek similar ends:

> Religion sets itself to translate these realities ('nature, man (sic), society) into an intelligible language which does not differ in nature from that employed by science; the attempt is made by both to connect things with each other, to establish internal relations between them, to classify them and to systematize them…the essential ideas of scientific logic are of religious origin…both pursue the same ends… (Durkheim [1915] 1965: 477).

Hence both science and religion are directed toward understanding the nature of the universe ('nature, people, society') and the relationship between them. Both attempt to impose a meaningful framework on an otherwise kaleidoscopic reality by linking heterogeneous things in a meaningful classificatory framework. While Durkheim upheld the rigor and disciplined methods of science in constructing its knowledge of the world, he argued that it didn't differ in fundamental principles from the way 'primitive' religions viewed and classified the world. As he says:

> The explanations of contemporary science are surer of being objective because they are more methodical and because they rest on more rigorously controlled observations, but they do not differ in nature from those which satisfy primitive thought….It has been said that the participations postulated by mythologies violate the principle of contradiction and are, for that reason, opposed to those implied by scientific explanations. Is not the statement that a man is a kangaroo…equal to identifying the two with each other? But our mode of thinking is no different when we characterize heat as movement, or light as a vibration of the ether, etc. Whenever we unite heterogeneous terms by an internal bond, we necessarily identify contraries. Of course the terms we unite in this way are not those

> which the Australian connects together; we select them according to other criteria and for other reasons; but there is no essential difference in the process by which the mind relates them (Durkheim [1915] 1965: 270-271).

Durkheim also inverts Weber's proposition that science disenchants the universe. Weber argues that science holds out the promise that the world can be known and understood rationally, that is, that it progressively robs the world of mystery. Durkheim counters; science, rather than solving mystery, generates it ([1915] 1965: 42). The idea of the supernatural as something arcane is derived not from pre modern (pre-scientific) sensibilities, but from the modern, scientifically inspired, notion that there is a natural order, capable of rational understanding and explanation (Durkheim [1915] 1965: 41). The idea of a natural order, operating on the basis rationally demonstrable laws, is a "…conquest of the positive sciences" ([1915] 1965:41). While there was no idea of a natural order:

> …the most marvelous events contained nothing which did not appear perfectly conceivable… for (the ancients there were) beautiful, rare or terrible spectacles…but they never saw in them glimpses of a mysterious world into which the reason cannot penetrate (Durkheim [1915] 1965:41; my inclusion).

It is science that deems things 'supernatural' and therefore mysterious because they confound rational explanation. Says Durkheim, "It is science and not religion which has taught men that things are complex and difficult to understand"([1915] 1965:42). Unlike Weber, Durkheim does not hold a vision of science progressively denuding the universe of mystery; it is science that proclaims and demonstrates mystery. It must be conceded, however, that Durkheim did believe science would progressively provide rational explanation for increasing domains of life. However, science would never supplant the universal place of religion in human society. Religion and religious symbolism, as an expression of the moral dimensions of life, would never be superseded. Nor would the place of religion in generating solidarity and communion through ritual ever be overtaken or replaced ([1915] 1965: 474-477). Durkheim did believe that religion, as a cognitive system, would be overtaken by sociology ([1915] 1965: 41-42). One hundred years later, his assertion is best interpreted as the evangelical faith of the newly converted.

Durkheim's theory of religion: symbol and ideology

Durkheim defines religion as, "…a unified system of beliefs and practices relative to sacred things, that is to say, things set apart and forbidden" (Durkheim [1915] 1965: 62). Religions are cosmologies in that they are 'primitive' ways of classifying and ordering the world, generating other forms of knowledge (Thompson 1993: 124). Durkheim himself says there is no religion that is not a cosmology at the same time that it is a reflection on divine things. In Durkheim's opinion:

> To a greater or lesser extent, all known religions have been systems of ideas which tend to embrace the universality of things, and to give us a complete representation of the world ([1915] 1965: 165).

In a later and more elaborate definition of religion, he considered it a:

> A system of ideas by means of which individuals represent to themselves the society of which they are members, and the obscure but intimate relations which they have with it. Such is its primordial role; and though metaphorical and symbolic, this representation is not unfaithful (Durkheim [1915] 1965: 257).

Religion, for Durkheim, represents social realities in two senses. Firstly, it represents society and social relationships in a cognitive sense, making them intelligible. It represents them in a second sense by symbolically and metaphorically dramatizing them. That is religion provides a means for people to understand their society and their relationship with it, as well as symbolically expressing the society and the relationship they have with it (Lukes 1988: 465). In addition to this interpretive dimension, religion is functional for social structures and processes. In particular, religion acts as a means of communicating ideas and emotions and for stipulating and regulating social relationships. Religious symbols are essential to this process: religion could not fulfill this role without an extensive network of symbols (Durkheim [1915] 1965: 264).

Regardless of what constitutes the content of the cosmology and the way it classifies these things, it ultimately reflects the society in which it exists. Durkheim presaged his later thought in *Le Suicide,*"Religion, is in a word, the system of symbols by means of which society becomes conscious of itself, it is the characteristic way of thinking of collective existence" (Durkheim [1897] 1975: 312). Moreover, a classification system is not merely a value-free descriptive arrangement of the things classified. It arranges things according to a hierarchy

that reflects the social arrangements and values of the social organization in which it exists. Says Durkheim, "…there really are relations of subordination and co-ordination, the establishment of which is the object of all classification…." ([1915] 1965: 173).

Ironically, given the prevailing view of Durkheim as a conservative functionalist, he met the agenda proposed by Comaroff (1982) to consider both the symbolic and the ideological dimensions of cosmologies. Durkheim himself recognized the origin and 'real' meaning of religions had to be veiled from adherents to maintain its power over them. He acknowledged that the 'objects' of religious belief and practice, whatever form they might take, have to be regarded by adherents as having an existence outside themselves, otherwise they have no legitimacy, no reality and, hence, no power. Says Durkheim:

> They must think of these powers, at least in part, as outside themselves, for these powers address them in a tone of command and sometimes even order them to do violence to their most natural inclinations…As long as scientific analysis has not come to explain it to them, men know well that they are acted upon, but they do not know by what ([1915] 1965: 239-240).

Shilling and Mellor (2001: 40-41), like Douglas (1975), suggest that Durkheim saw 'the sacred' as binding the social and moral order. Durkheim sounds like a theorist of ideology in saying, "…religious interests are the symbolic form of social and moral interests" ([1915]1965: 356). What religious rituals and rites achieve is the integration of people into society, stressing, in Thompson's words, their "…dependence on a superior moral force that saved them from chaos and disorder" (Thompson 1993: 131). Sacred things, places or persons, whether pure or impure, have social authority; specifying social relationships, underpinning and shoring up social institutions, as well as conferring social status. 'The sacred' is not merely one aspect of the social, it is indissolubly part of all social phenomena and legal and ethical systems, philosophy, art and science all have roots in religion (Shilling and Mellor 2001; 41).

Thompson (1998) suggests that Durkheim regards ideology as a universal feature of social life because it provides a representation of social structure and social relations. In Thompson's assessment, Durkheim's view of religion has strong affinities with Althusser's notion of ideology. What Althusser would deem 'ideology' and what Durkheim would call 'religious belief' are united in that they:

> …reproduce the social order by symbolically representing it as a unity in which the individual subject has a place. At the same time the symbols operate so as to generate a sense of identification and commitment. Thus the individual is hailed or constructed as a subject within a symbolic discourse, and it is these symbolic discourses which constitute ideological or imaginary communities (Thompson 1998: 94-95).

Sacred and profane

The heart of any religion, in Durkheim's view, is the distinction between sacred and profane. The profane is the mundane world of everyday life and the ordinary things encompassed within it. It consists of 'sensations' coming from the physical world and of 'vulgar' things concerned with our individual physical existence (Durkheim [1915] 1965: 350-351; Lukes 1988: 25-26). The profane is the domain of private, utilitarian pursuits, where we seek to satisfy individual goals. Working and eating, for instance, are archetypically profane activities since they are directed only at satisfying the material requirements of individual lives, or so Durkheim believed ([1915] 1965: 345). Work, by way of example, relates only to 'temporal activities' and "…puts us in relations with ordinary things only" (Durkheim [1915] 1965: 346). While he sounds moralistic and disapproving about the profane, Durkheim recognized it as necessary and as the domain in which much of life is lived:

> We hold to the profane world with all the fibres of our flesh; our senses attach us to it; our life depends on it. It is not merely the natural theatre of our activity; it penetrates us from every side; it is part of ourselves. So we cannot detach ourselves from it without doing violence to our nature and without painfully wounding our instincts ([1915] 1965: 351).

By contrast with the profane, which is mundane and routine, the sacred is inviolate and inviolable. Sacred entities are separated from profane ones and must remain so to protect their sacred status. Sacredness is beyond the ordinary state, or power, of individuals and is beyond, or outside, natural, rational processes (Durkheim [1915] 1965: 337-339). The sacred is thus associated with the anomalous and mysterious, drawing attention away from the mundane and the routine. Sacredness directs attention to transcendent values or themes and elicits awe and reverence (Durkheim [1915] 1965: 218-219). Moreover, sacred entities are contagious and can spread their sacred quality by mere propinquity and for that reason need to be hedged in

by various interdictions (Durkheim [1915] 1965: 363-364). The sacred, moreover, is ambiguous, having impure as well as pure forms, benign and malignant expressions. One dimension of the sacred is beneficent and is the source of health, sustaining the natural and social orders. The sacred's other face is impure and evil and is the source of disorder, sickness, death, and sacrilege. In its face, we experience fear and horror (Durkheim [1915] 1965:455-458). Why should there be an impure form of the sacred? Religion and therefore the sacred-profane distinction reflects society, and reflects, "…all its aspects, even the most vulgar and repulsive" *(*Durkheim [1915] 1965: 468*).* Durkheim observes that society is, "…full of defects and imperfections. In it, evil goes beside the good, injustice often reigns supreme and the truth is often obscured by error" ([1915] 1965: 467). The impure form of the sacred expresses this dimension of society.

There is no inherent attribute that making a thing, place or person sacred. Sacred things are, "…collective ideals which have fixed themselves on material objects" ([1915] 1965: 269). The material objects, whatever they are, symbolically communicate and reinforce sacred status. In one example Durkheim explains, "…the churinga, nurtunja and waninga owe their religious nature solely to the fact that they bear the totemic emblem. It is the emblem that is sacred" ([1915] 1965: 147). Hence there is no universal sacred place, person, or object; sacredness is always dependent on social context, because the social values that are protected are relative to given contexts (Durkheim [1915] 1965: 474-475). Durkheim considered that things accorded sacred status merely represented social values: the sacred object, place, or person is thus symbolic. Sacredness is society's way of representing its beliefs, values, and knowledge systems publicly and in a way that reinforces them for members of that society. The inviolability associated with sacred things lies in their protection of the social values and systems of knowledge they represent and that are themselves sacred.

Do sacred and profane have relevance in late modernity?

There is a tension between the diminution and universality of the sacred in Durkheim's thinking about religion (Lukes 1988: 474; Shilling and Mellor 2001: 48-49). Advocates of the secularization thesis, as Shilling and Mellor (2201: 48-49) suggest, hold that Durkheim's theory of society, as underpinned and sustained by the forces of sacredness and the symbolic order it generates, is untenable given the marginal place of sacredness in modern, secular societies.

As Lukes observed, Durkheim's treatment of religion is complex, if not ambiguous (1988: 450-484). Certainly, some forms and functions of religion have atrophied with the onslaught of modernity, but in Durkheim's view, there were eternal functions of religion that would not be supplanted. As he says:

> Thus there is something eternal in religion which is destined to survive all the particular symbols in which religious thought has successively enveloped. There can be no society which does not feel the need of upholding and reaffirming… the collective sentiments and the collective ideas which make its unity and its personality ([1915] 1965: 474-475).

Durkheim himself asserted that some of religion's roles, narrowly defined, would be increasingly circumscribed within modern nations. However, the function of religion could never be supplanted and hence would always survive in some form, though that form would inevitably change. The cognitive functions of religion would be overtaken by science/sociology, but its social function, as a force of social integration and regulation, would never be replaced; there was something eternal and universal in this dimension of religion. Durkheim managed to achieve something of a rapprochement with Weber's position on religion in the rationalized Occident; religion would become more secular and more rationalized (Lukes 1988: 476-477). However, the 'expressive' function of religion would also change but never be entirely effaced; symbolic representations of social life are as necessary to social life as material sustenance (Lukes 1988: 475). That forms of religion will vary in different contexts, including being highly secular in character, would not be news to Durkheim. Because religion is a reflection of society, it will necessarily change as society changes (Durkheim [1915] 1965: 113-114). The idea of an unchanging religion, constant in form and content, hardly fits with Durkheim's notion of religion.

Those who have taken up the notion of a 'secular religion' have documented its usefulness in explaining diverse phenomena. Bellah (1970: 179) defines civil religion as an "…apprehension of universal and transcendent religious reality…" even in the often apparently a-religious world of politics. Civil religions, in his view, symbolically link political structures and processes to 'transcendent' value systems. Likewise, Shils (1975) has explored the way even pluralistic, differentiated societies have symbolic centers, generating awe and charismatic power. Others have used Durkheim's theory of religion and the concepts of sacred and profane to illuminate and explain phenomena as diverse as the 'Watergate scandal' in America (Alexander 1990b), friendship (Wallace and Hartley 1990), television

presentations of particular events (Daylan and Katz 1990) and even social conflict (Collins 1990). Other theorists have noted a return of ‘eruptions of the sacred’ in modern / postmodern societies evident in TV broadcasts, melodramas, sporting events, celebrity cults as evidence of the presence of the sacred in modern / postmodern societies (Shilling and Mellor 2001: 51). As Shilling and Mellor point out:

> An awareness of the religious forces that circulate within significant areas of social life need not preclude an attention to the highly rationalized, profane character of other dimensions to modern societies (2001:52).

Social life is, in fact, a structured process of collective confrontations with the sacred (Shilling and Mellor 2001: 43). According to Durkheim, collective representations are the forms through which “…individuals imagine the society of which they are members and the obscure yet intimate relations they have with it” ([1915] 1965: 257). However, unlike those Alexander (1990a) and Jordanova (1995) would deem 'mechanical' theorists, Durkheim does not treat symbolism as a reflection of material or political forces. Thompson (1998: 93-94) agrees with Alexander (1990a) that Durkheim accords cultural factors (that is, symbolic ones) theoretical autonomy; they are not mere puppets of 'interests', however theorized. To place Durkheim's thought within Comaroff's (1982) framework, it is necessary to consider the content of belief systems (their symbolic dimensions) and the consequences of their application in social life (their ideological function). Durkheim does accord symbolism a central place in social life. Religion and society depend on symbolism. In his view:

> Social life in all its aspects and in every period of its history, is made possible only by a vast symbolism…without symbols social sentiments could have only a precarious existence ([1915] 1965: 264).

However, religion is for Durkheim simultaneously ideological in that it, "…translates some human need, some aspect of life, either individual or social ([1915] 1965: 14). The symbolism of religion translates the reality of the individual's place within society. Durkheim thus advocates analysis of symbols and of their 'ideological function'. In this, he unites a focus on 'culture' (symbolism) with a focus on 'society' (the structure) with which culture is inextricably linked. A Durkheimian framework thus offers a way of fusing concerns that have somewhat dichotomously been allocated to, or abrogated by, anthropology and sociology.

Assessment of Durkheim's theory of sacred and profane

What is the significance of Durkheim's theory of religion outlined in *The Elementary Forms of the Religious Life*? It has been subject to range of critiques, including its ethnography, methodology and its logic. Some of its theoretical claims have also been challenged (Lukes 1988: 477-482). In particular, its insistence that social morphology determines the belief systems of a given society is not sustainable, according to Lukes (1988: 441-448). While Lukes finds the causal link posited by Durkheim between social morphology and religion 'problematic', the attempt to see the relationship between them is fruitful, in his view (1988: 447-448). Thompson suggests that the best way to interpret the tie between religion and social structure is as 'metaphoric parallelism'; that is, religious beliefs symbolize social forces (Thompson 1993:137-139). Alexander (1990b: 189) claims that Durkheim's perspective on the relationship between society and religion is best viewed as a metaphorical demonstration of the power of the sacred; social conflict is like conflict between sacred and profane, or between impure and pure forms of sacredness, for example. It is a powerful means of demonstrating the non-utilitarian, non-profane dimensions of social life. However, Durkheim's claim that society and religion are virtually synonymous leads to a one-dimensional view of society, implying that values, beliefs and solidarity are only generated through rituals expressing the sacred. It also implies, says Alexander, that the profane world is value free and, indeed, barely social; a view with which Lukes would concur (Alexander 1990; 190; Lukes 1988: 26-27).

Lukes also argues that Durkeim's insistence that the sacred / profane distinction included all things and that they were mutually exclusive, undermines its utility (1988: 27). It does not allow for the existence of things that are not affected by the sacred. Moreover, it makes the profane merely residual when it actually encompasses a number of distinct possibilities; minor sacredness, non sacredness and anti sacredness (Lukes 1988: 26-27). Part of the reason for this lack of conceptual clarity, in Lukes view, is that Durkheim failed to differentiate sacredness as a radical classification of things and sacredness based on the way people feel about and act toward them (Lukes 1988: 26-27). Alexander also suggests that Durkheim was unclear in the way he applied the concepts of sacred and profane and that at times the profane world was rendered barely social by Durkheim's treatment of the concepts (1990b: 190). However, both Alexander (1990b) and Douglas (1975) agree that whatever flaws Durkheim exhibited in framing and applying the concept, it retains great analytical power.

Given these substantial theoretical critiques, what are the valuable legacies of *The Elementary Forms of the Religious Life* and what is their significance for this thesis? Lukes points out that Durkheim did regard religion as intrinsically having an important effect (1988: 460). It is not, as Marx holds, mere opiate of the people. Nor is it purely illusory "…a system of hallucinations…." (Durkheim [1915] 1965: 99). While Durkheim did not automatically accept the beliefs of religions as 'true', he did consider that they always reflected something that was true ([1915] 1965: 14-15). The point of studying religion, for Durkheim, was "…to go underneath the symbol to the reality that it represents and which gives it its true meaning" ([1915] 1965: 469). Extrapolating from Durkheim's theoretical framework to my intention in this thesis, I want to consider biomedicine as a secular religion. My primary intent is not to adjudicate the 'truth' of biomedical knowledge but to consider what its classificatory and conceptual system symbolically reveals about the underlying system of knowledge and values in which it is embedded.

Hence, from the perspective of this thesis, a primary theoretical legacy of *The Elementary Forms of the Religious Life* is the embryonic awareness that science and religion are not structurally dissimilar and that they can both be regarded as cosmologies, embodying a distinction between the sacred and the profane. Durkheim himself laid the groundwork for this recognition, though without fully developing his own insight:

> The rites which he (the 'primitive') employs to assure the fertility of the soil or the fecundity of the animal species on which he is nourished do not appear more irrational to his eyes than the technical processes of which our agriculturists make use, for the same object, do to ours (Durkheim [1915] 1965: 40).

Lukes observes that Durkheim did believe that all societies have belief systems that accord some things sacred status (Lukes 1988: 475). Of course, being a good son of his age Durkheim did truly believe that modern science (read 'sociology') was, in fact, a more accurate approximation of reality and was therefore more 'true' and effective than 'primitive' religion ([1915] 1965: 495-496). However, as Douglas notes, had Durkheim exhibited a more consistent epistemological stance, he would not have accorded scientific knowledge sacred status, inviolate from the profaning influence of sociological analysis (1975: X1V). It is merely more consistently Durkheimian than Durkheim was himself to explore the possibility that biomedicine is a belief system that creates a symbolic classification system structured around the concepts of sacred and profane. The work of Mary Douglas is a useful entrée to a more detailed examination of this issue.

MARY DOUGLAS: SACRED, PROFANE AND CLASSIFICATION SYSTEMS

One of the most useful and influential attempts to use Durkheim's theory of religion, including the sacred-profane distinction has been by Mary Douglas (Shilling 1994: 72-74; Turner 1991:5). Douglas's comments on the sacred are welcome because she widens her focus beyond an exclusive vision of it as 'pure' or 'revered' to suggest that the sacred is also dangerous. She suggests that the danger and therefore inviolability of sacredness stems from the vision if offers of 'unmediated' reality. According to Douglas, "Durkheim's theory of the sacred is a theory about how knowledge of the universe is socially constructed" (1975: XIV). Says Douglas, "… unless the sacred beings (or, in our culture, sacred concepts) are credited with an autonomous existence, their coercive power is weakened and with it the fragile social agreement which gave them being" (1975: XIV). However, we must veil our understanding of the conventional, or constructed, quality of the universe. In our culture, we must believe that some things—Nature, God, Science, Truth, Reason—have their origins outside and beyond human thought, otherwise such concepts lose their sacred status and their power.

For this reason, the sacred is hedged in and set apart from the non-sacred by a series of interdictions. Foucault (1970) reflected on how discourses demarcating truth and falsity rest on exclusion about what may be said, if not thought; Durkheim recognized this long before (Douglas 1975: XVI-XVII). We see the principle of sacredness operating in our own 'universe', according to Douglas, by the sense of threat attached to the notion of relativism and the attempts to exclude it from discourse connected with Truth. Marx and Freud, for instance, challenged sacredness by suggesting that at any one time our world-view is mere ideology or just the drapery of consciousness concealing an irrational subconscious that actually fuels our conduct (Douglas 1975: XV1). One can argue that the intensity of the debate surrounding the work of contemporary iconoclasts such as Foucault also represent a safeguarding of our sacred ideas / ideals (why separate the two concepts)? The debate between Bury (1986: 137-169), on one hand, and Nicolson and McLaughlin, on the other (1987: 107-126), conducted in the pages of *The Sociology of Health and Illness* over the spectre of relativist views of biomedical knowledge suggests that the concept of objective truth still has some sacred status in our culture.

Douglas argues that knowledge and beliefs are composed of foregrounded and backgrounded dimensions (1975: 3-8). In Douglas's view this backgrounded knowledge "…furnishes the stable background on which more coherent meanings are based" (1975: 3). Some information is backgrounded because it is regarded as too self evident to warrant explicit articulation and

recognition. Other knowledge is backgrounded because it is dangerous and conflicts with what is generally known. All cultures construct catalogues of sources of danger and defilement; to openly acknowledge, that is to foreground, these threatening and polluting things is to threaten the source of order their backgrounding upholds (Douglas 1975: 243-244). Durkheim held that the dangerous powers attributed to the gods are, in fact, powers invested in the culture and social structure for defending itself. Backgrounding hides the things that can threaten the classification that is the knowledge system of a given society.

The intensity of debates about threatening things is precisely because systems of thought are never just cognitive or instrumental; they have meaning and value invested in them. Says Douglas:

> The deepest emotional investment of all is in the assumption that there is a rule-obeying universe, and that its rules are objective, independent of social validation. Hence the most odious pollutions are those threatening a system at its intellectual base (1975: 243).

To return to Douglas' distinction between foregrounded and backgrounded knowledge; the knowledge that the churinga is sacred is foreground knowledge. The knowledge that it protects and reinforces—the social value of the emblem—is the implicit, backgrounded knowledge. Symbols are what link backgrounded and foregrounded knowledge and are powerful because they reinforce the sacred (Thompson: 1993: 138).

KNOWLEDGE AND CLASSIFICATION IN MODERNITY

Using the kind of argument sketched by Douglas, what is the cosmology, the classification system, prevailing in our culture and what is foregrounded and what is backgrounded? Durkheim's comments on religion could equally apply to the knowledge produced by the intellectual revolution of the 17th Century:

> …all known religions have been systems of ideas which tend to embrace the universality of things, and to give us a complete representation of the world (Durkheim [1915] 1965: 165).

To understand this cosmology, it is necessary to understand our collective representations. Durkheim argued that concepts are 'collective representations'. Concepts include categories, "…the pre-eminent concepts, which have a preponderating part in our knowledge" (Durkheim [1915] 1965: 488). However, contrary to Kantian *a priori* reasoning and Hume's empiricist

account, these concepts are socially derived (Durkheim [1915] 1965:22-28). Concepts and classifications systems associated with them correspond to particular social organizations. In Durkheim's view, classification systems are modelled on the social systems in which they are formed. I don't want to develop this social structural strain of Durkheim's argument by tracing the classification of modernity to its form(s) of social organization; I merely want to make the point that Durkheim is a proto constructionist in arguing that thought (ie 'knowledge') is produced in particular social settings. It does not have an existence in an Archimedean, a-social domain. For Durkheim, classification is an essential dimension of social life. Society is, for Durkheim:

> …possible only when the individuals and things which compose it are divided into certain groups, that is to say classified and when these groups are classified in relation to one another (Durkheim [1915] 1965: 490).

To understand our collective representations and the kind of symbolic classification they imply, it is necessary to understand 'our' knowledge and its associated values and 'world view'. In sketching a brief and highly selective history of Modernity, I acknowledge the debate about its characteristics and chronology (Featherstone 1988; Rosenau 1992). Rosenau offers the following as characteristics of modernity; industrialization, urbanization, technology and the nation state, humanism, liberal democracy, egalitarianism and rationality (1992: 5-6). Borgman takes three elements of 17th Century history as modernity's defining features; Cartesian rationality, Bacon's view of science and Locke's articulation of liberal theory (1992: 22). Epistemologically, modernity is characterized by a commitment to:

> …the progressive liberation of humanity through science and the idea that philosophy can restore unity to learning and develop universally valid knowledge for humanity (Featherstone 1988: 209).

I follow Toulmin (1990), Berman (1981) and Borgman (1992) in dating modernity's origins in 17th Century Europe. Sociology accords the heritage of Cartesian rationality a dominant place in what is understood as modernity (Lash 1999). I take the aspects of the 'Scientific Revolution' of the 17th Century, Cartesian rationality, the development of capitalism and the rise of liberal individualism as the pillars of modernity. In this thesis, however, I devote more attention to Cartesian thought and the scientific revolution than to capitalism and liberalism. I consider a few key epistemological and intellectual elements of Descartes' thought and the body of knowledge conveniently designated as 'the scientific revolution'. These factors bear upon contemporary biomedicine in ways of direct interest to this thesis.

In what follows I treat 'Europe' as if it were a single, homogenous entity rather than a convenient abstraction. It is not the place of this thesis to offer an account of the 17th Century that considers particular national and regional histories, nor even to provide a detailed outline of the 17th Century. I simply outline some of the defining features of modernity that developed primarily in England and that are identified, historically and sociologically, as 'European' or 'Western'. Christopher Hill (1972) claims that the world was turned 'upside down' in the 17th Century. What justifies such a grand claim? In that century, modern science emerged and exploded into frenetic activity, Descartes inaugurated the undermining of Aristotelian dominance of philosophy and articulated a version of rationality that still has currency, capitalism emerged in embryonic form, the beginnings of secularism are apparent and the political doctrine of liberalism is first articulated. It was a revolutionary century, giving rise to a new mode of thought and new forms of social, political and economic life.

Cartesian philosophy is credited, or blamed, with being the wellspring of that revolution:

> *Cogito ergo sum*: if the modern world has a beginning it is there. The 'Age of Reason' dethroned authority in religion and politics, and laid the foundations of a society based on the apparently limitless increase of wealth through the systematic comprehension and exploitation of nature….giving us both the medicines which have enabled us to sustain ourselves and the ills we have failed to cure (Moore 1993: X).

SALIENT ELEMENTS OF 17TH CENTURY THOUGHT

Scepticism

Descartes thought was framed in an era of "disorienting discoveries" as well as crumbling institutions and cultural conditions (Tarnas 1991: 275). In this context, scepticism and relativism concerning the certainty of knowledge were the dominant epistemological moods; old, authoritarian bases of knowledge were no longer automatically trusted (Tarnas 1991: 275-276). Cartesian rationality, a legacy with which 'we' still struggle, is motivated by the vision of and a crusade for certain knowledge that begins curiously enough with doubt. In Descartes' words, he would accept nothing he had previously believed as true:

> …I decided to suppose that there was nothing at all which was such as they cause us to imagine it…I rejected as being false all the reasonings I had hitherto accepted as proofs ([1637]; 1968: 53)

The guiding theme of Descartes *Meditations*, according to Bordo, was how could one be sure that one's knowledge was not based on one being deceived? (1987: 14). For Descartes, a dualist in all things, only two possibilities existed; complete certainty or total epistemological chaos, says Bordo (1987: 17). The deceptive power of the 'Evil Demon' haunts Descartes' thought; a power who:

> …has used all his artiface to deceive me… the heavens, the air, the earth, colours, shapes, sounds, and all other external things that we see are only illusions and deceptions which he uses to take me in (Descartes [1637]:1968: 100).

The metaphor characterizing Descartes' quest for knowledge is that of 'purging'; the mind must rid itself of all received knowledge, of all that it has taken for granted (Bordo 1987: 14). If one cast aside the presumptions inherited from tradition, one's own senses, or authority, of what could one be certain? Only, ultimately, the fact of one's own thought. All other knowledge of the self or the world around the self could be a delusion, but the fact that one could think grounded and 'proved' one's own existence. This ability to consciously conceive of one's self, as it were, also proved the existence of God. The human capacity for reason, for clear and precise thinking, must come from somewhere (Descartes [1637]; 1968: 148). Only God's existence provides any grounds for certainty. God, for Descartes, is the "…principle of continuity beyond the discontinuity's of human experience" (Descartes [1637] 1968: 148).

While Descartes' God was important, he was not actively engaged in his world (Berman 1981).[1] As conceptualized by Descartes, God had created the world and the 'laws' that guaranteed its operation, but then retreated to its periphery. God, as spirit, was not involved in the operation of the world, which was governed by laws of matter and motion, cause and effect. In fact, so mechanical was Descartes' description of the universe, and so inactive was his God within it, that he was considered, in some quarters, little removed from atheism (Porter 2000: 56). For earlier dualist thinkers, such as Plato, the external world remained a source of knowledge even though matter and spirit were different and distinct entities (Taylor 1992: 144-145). For Descartes, however, there is no external order of ideas; the cleavage between matter and spirit has become, in his thought, a chasm. In Taylor's opinion, Cartesian thought is the fundamental source of disenchantment (1992: 146). In Taylor's view, the natural world and our own bodies are "…disenchanted…mere mechanism…devoid of any spiritual essence or expressive dimension" (Taylor 1992: 146). The cosmos is no longer a meaningful source of knowledge. Knowledge, for Descartes, comes from disengagement from

[1] It is difficult to envisage that Descartes' God was anything other than masculine.

the external world, according to Taylor (1992: 146). Nevertheless, this disengagement did not preclude control of the natural world. Rational understanding of the world is a means for rational and instrumental control (Taylor 1992: 148-149).

The heritage of Descartes abstracted, disengaged rationality are a set of dichotomies, each of which implies the other; mind and body, culture and nature, as well as fact and value. The mind as the repository of rational thought stood sharply separated from the passions of the body. Nature, as inert, mechanical matter was a radically different domain from that of culture, which expressed human rationality and purpose. True knowledge was based on facts, excluding the supposed subjectivity of values. Subjectivity and the world of objects belonged to distinct realms. Dualism had long been a feature of 'Western' thought, but Descartes didn't so much juxtapose these qualities are radically and irreducibly cleave them. Mind and body, nature and culture, together with subject and object were regarded as ontologically different; mind, culture and facts were valorized over the deceptive and potentially disruptive domains of bodies, nature and values.

Mind-body dualism

Mind-body dualism is one of the most famous, if not infamous, intellectual Cartesian legacies. The world is divided between spirit (the thinking essence, whether human or that of God) and matter, including human bodies (Bordo 1995: 73). The body is alien to the 'real', thinking self. We are divided into thinking subjects, whose bodies are *res estensa* and operate according to laws of matter and motion. The body was, like nature, a mechanical object governed by impersonal laws of anatomy and physiology. Hence the mind played no role in the functioning of the body, nor did other 'extraneous' influences. In Bordo's assessment, for Descartes, the body is the main stumbling block to objectivity (1987: 26). In Capra's words, "…there is nothing included in the concept of body that belongs to mind; and nothing in that of mind that belongs to the body" (Capra 1982: 45).

According to Bordo, the implication of the Cartesian notion of the sharp distinction between mind and body is that the body is regarded as alien to the real, that is, thinking self. The self should be driven by 'pure' thought not bodily impulses. Consequently, the body is experienced as a limitation to rational agency; the rational person seeks to break free of bodily impulses. It is not such a big step from these premises to regard the body as the enemy of rational thought and agency. Not surprisingly, the body becomes the site of all that threatens the control of rational agency (Bordo 1995: 144-145).

Nature-culture dualism

A profound implication of separating mind and matter was the re-definition of nature. Since rationality lay with spirit, matter became a kind of brute, insensible entity. Nature became regarded as a greater manifestation of *reg extensa;* a massive mechanical object, ontologically separate from the domain of spirit. Much has been written about the 'disenchantment' of nature by the thought and practice that emerged in the 17th Century (Berman 1981; Merchant 1990). As Shapin says, "The machine metaphor" became "…a vehicle for 'taking the wonder out' of our understanding of nature" (1998; 36). Nature, from this perspective, is inert, having no intrinsic life force, nor any intrinsic purpose. Shapin (1998: 30) argues that 17th Century philosophers modeled nature on a machine. It is a collection of matter that operates according to abstract laws. According to Robert Boyle, mechanical philosophy rested on two fundamental principles; matter and motion (Shapin 1998: 46). Because nature is essentially an object, we are separate from it and have no relationship with it other than one of utility. Prior to this period, nature had been conceptualized as "… a cloak worn around the shoulders, not a stage upon which men (sic) walked" (Thomas 1983: 18). Williams (1998: 220), charting changing historical meanings of 'nature', finds that by the 17th Century the term no longer refers to an inherent force operating in the world, it simply meant the material world. Indeed, Merchant (1990) argues that the 17th Century culminated in the 'death of nature'. The 'old' view of nature as an organic, living entity was replaced by the belief that it was composed of inert constituents, governed by rational immutable and potentially controllable laws. It became on object for scrutiny and manipulation. Science made the promise that the chaos of 'nature' could be quelled and human order, via reason and culture, made sovereign.

Because of nature's 'new' inert, mechanized quality it, "…was entirely objective and solidly and unambigously material, it was inherently measurable" (Tarnas 2000: 278). The means for measuring and analysing it was reductionism (Tarnas 2000: 278). A corollary to the mechanized view of nature was the creed of atomism. Because nature, in the Cartesian paradigm is inert and mechanical, it can be analysed as a series of parts. This gives rise to reductionism (Capra 1982: 44) because it suggests that things can be understood in their entirety by comprehending and intervening on constituent parts.

Fact-value dualism

As part of his quest for radical certainty, Descartes regarded mathematics as the apex of clarity of thought (Tarnas 2000: 276; Toulmin 1990). Part of Descartes's ambition was to

establish mathematics as a universal language of clear, scientific thinking (Lash 1999; Berman 1981). The belief in the certainty of scientific knowledge lies at the basis of Cartesian philosophy (Capra 1982: 42). The supposedly indispensable role of mathematics in crafting precise and certain knowledge was taken up by other figures during the century. For Galileo, because nature was itself mathematical it was best understood mathematically. In Shapin's view, "Modern natural philosophers…were widely agreed that mathematics was the most certain form of knowledge…" (1998: 58). This lead, in the opinion of Shapin, to the valorization of method; "Method was meant to be all" (Shapin 1998: 90). The machine metaphor became a guide for how to acquire knowledge, not just its content (Shapin 1998: 90). Method would guard against being deceived by the senses, as Bacon and Descartes so feared. As Capra concludes, while the medieval world-view was directed toward understanding the meaning and significance of things, the modern mind became attuned to predicting and controlling them (Capra 1982: 38).

Precision, clarity and accurate description of reality were to be the guiding rules of language. Hobbes and Locke railed against the use of metaphor, arguing it promoted error in understanding. Locke charged that, "All the Art of Rhetoric is for nothing but to insinuate wrong Ideas, move the Passions and thereby mislead the Judgement" (quoted in Porter 2000: 61). In line with the scientistic tenor of the times, a prominent feature of 17th Century intellectual life was a sustained attack on rhetoric. According to Lash:

> Modernization from the positivist point of view can be read significantly as a process in which rhetoric is progressively stripped away from concepts and propositions, to be replaced by representation possessing clarity and distinctness (Lash 1999: 94).

This concern with a positivist view of language melded two concerns. One was the separation of subject and object. Since objects had an independent existence, they should be described objectively. The second concern—the determination to avoid error, to establish absolute certainty of knowledge—also contributed to the desire for 'minimalist' language. Herein lies the wider modern obsession with distinguishing pristine, unimpeachable 'fact' from murky, questionable 'value'.

Descartes's rationality and Bacon's empiricism

The Scientific Revolution was such a profound event, in part, because it married rationalism, the pillar held by Descartes, with empiricism, upheld by Bacon (Berman 1981: 49; Tarnas

2000: 280). Indeed, Tarnas argues that Descartes and Bacon are the twin epistemological pillars of the modern mind (Tarnas 2000: 280). The fusion of rationalism and empiricism in large part explains so much of modernist epistemology and social life (Tarnas 2000: 280; Berman 1981: 50). For Bacon, thinking about the world was a poor substitute for acting upon it, yet action was to be guided by precise scientific methods. From the perspective of our epoch, it is difficult not to demonize Bacon. His empiricism, combined with evangelical zeal to develop technology and exploit nature for the generation of boundless wealth, trumpets a version of progress embodying its 'dark side'. If Descartes hungered after complete certainty, Bacon urged a vision of boundless progress directed to:

> … the knowledge of causes and secret motion of things, and the enlarging of the bounds of human empire, to the effecting of all things possible the effecting of all things possible (Bacon [1627] 1870:156).

In all of these endeavours, Bacon used language still shocking for its misogyny and violent sexual imagery. Nature was personified as a woman keeping secrets and Bacon insisted that in the interests of:

> …further disclosing the secrets of nature…a man (ought not) make scruple of entering and penetrating into these holes and corners, when the inquisition of truth is his whole objective….(Bacon [1620]1870: 247).

Bacon's strident and audacious statements make him one of the less appealing but central figures of this period. His endeavours saw him lauded by the Royal Society as the "father of experimental philosophy" (Porter 2000; 57). Bacon was uninterested in knowledge for its own sake; it was merely a means to an end. What end? "Knowledge is itself power". Like many of his contemporaries, Bacon was explicit about over turning the old philosophy; calling his 1620 publication *Novum Organum* was a deliberate refutation of Aristotle's *Organum*, regarded as too passive in face of the clear need to "take hold of nature" (Berman 1981). He also challenged the dominant view of time as cyclical; claiming it was linear in its path to progress. Not shy about stating the significance of this change, Bacon published *The Masculine Birth of Time*. Time became a marker against which progress could be measured. If one of Descartes less than gratefully received legacies is his valorization of abstracted rationality applied to a mechanistic universe, one of Bacon's most unfortunate bequeathments is his insistence on the imperative of domination, conceptualized as progress. Characteristically, he was not reticent about his role in formulating the 'new philosophy' that

promised unbridled conquest, “I am come in very truth leading you to nature with all her children to bind her to your service and make her your slave” (Bacon [1620] 1870: 257).

The 17th Century may have been a period of revolutionary activity but intellectualism was little valued for its own sake. Modernity, according to Lash, is technology and technology is about the use of knowledge (1999: 92). Key thinkers of the 17th Century wanted to achieve things not reflect on them. Emancipation from the disorder of the immediate past was a key impulse according to Porter (2000: 48). Nor was this emancipation to take the form of unhurried evolution, rather the prevailing mood was inclined to think of emancipation as, ‘…snatching off a blindfold or bursting free from a straightjacket” (Porter 2000: 48). While some societies or epochs seek transcendence or worship custom, the energies of the 17th Century were directed toward escaping the past and creating a new future (Porter 2000: 48). In the middle part of the century a medic offered a creed for the age; it could also have been a template for his profession, “Works, not Words; Things not Thinking…Operation, not meerly Speculation” (quoted in Porter 2000: 53). Berman charges that 17th Century scientists / philosophers were interested in ‘How’, not “Why’ things happened. In Berman’s opinion, ‘How’ became increasingly important, ‘why’ became increasingly irrelevant and in Berman’s view, in the twentieth century…”how” has become our “why” (Berman 1981: 28).

The consequence of Descartes’ strident rationalism and the impact of the scientific revolution gave rise to the following set of dichotomized values:

Table 2.1: De-valued and valued concepts in the epistemology of modernity

Devalued concepts	**Valued concepts**
Nature	Culture
Body	Mind
Subjectivity	Objectivity
Matter	Spirit
Rhetoric/Metaphor	Positivist Language
Non-Science	Science

TWO HISTORIES

However, there are two histories of the 17th Century. The first, now under challenge in some quarters, is decidedly Whig in tone. The historian Butterfield formulated the term ‘Whig history’ in reference to a tendency among some historians to regard history as a battle between conservatives and progressives, in which progressives win and in so doing help inaugurate the modern world (Bullock and Stallybrass 1977: 674). Whig history is underpinned by notions of teleology and entails assumptions about what constitutes progress and the ideal end point of history. The history of the 17th Century is still frequently read as

Whig triumph. It saw rationality supersede mere faith, science replace superstition, politics rest on open democracy not arbitrary authority, nature harnessed, technology developed and material prosperity flourishing. Put succinctly, it culminated in Enlightenment (Toulmin 1990; Porter 2000).[2] Curiously, Butterfield himself exemplifies this sensibility in judging that the 17th Century and the scientific revolution:

> …outshines everything since the rise of Christianity and reduces the Renaissance and the Reformation to the rank of mere episodes…(it is) the real origin both of the modern world and of the modern mentality (Butterfield 1965: 3).

The other history of modernity is an elegy to a world lost. An organic world and a holistic epistemology have been pushed aside by the forces of disenchantment and moderns live in a world devoid of connection, aesthetics and meaning according to its spokespeople (Berman 1981; Merchant 1990; Capra 1983). This 'disenchantment thesis' also significantly colours much sociological thinking about modernity, having been given an articulate voice through Weber. While I have greater sympathy with this second history, I believe it too has some serious deficiencies and will address them now. Let me first list what Berman (1981), as representative of the Elegiac school, suggests characterize the differences between pre–modern and modern sensibilities:

Table 2.2: Pre-modern and modern cosmology

Pre-Modern	**Modern**
Geocentric closed universe with God enclosing it.	Heliocentric, infinite universe in which Earth has no special status, kept together by gravity.
Teleological explanation; everything except God in the process of becoming.	Things explained by matter and motion and have no intrinsic purpose.
Static, cyclical time.	Linear, progressive time.
Nature understood concretely and qualitatively. Nature is alive and organic.	Nature understood abstractly and quantitatively. Nature is dead and mechanistic.

(adapted from Berman 1981: 50)

The distinctions outlined in the table above also imply, implicitly or explicitly, the following distinctions:

[2] Porter would endorse the term 'Enlightenment' for the knowledge, values and form of social organization that had their beginnings in the 17th Century. Toulmin uses the term with greater ambivalence.

Table 2.3: Assumptions underlaying pre-modern and modern epistemology

Pre-Modern	Modern
Divine Purpose	No transcendent purpose
Value Rational Action	Instrumental Rational Action
Religious/Transcendent	Secular/Immanent
Connection	Atomism
Meaningful cosmos and existence	Meaningless cosmos and existence
Symbolism	Instrumentalism
Value	Fact

Taking these two readings of 17th century history, of the onset of modernity, we either have a triumphalist account of the dawn and onward spread of 'Truth' and 'Reason', or an account that is mournful about the death of meaning. Two theoretical perspectives offer useful correctives to these readings of modernity. The first is historical and looks at the emergence of Cartesian rationality and the juggernaut of the scientific revolution as a response to crisis rather than a disinterested advance in knowledge (Toulmin 1990). The second theoretical contribution to re-thinking the 'progress versus death of meaning' debate comes from a more culturally sensitive reading of modernist epistemology. Charles Taylor (1995) and Mary Douglas (1975) provide a platform for this perspective. I will discuss each of these theoretical contributions in turn.

ALTERNATIVE READINGS OF 17TH CENTURY HISTORY

A history of crisis

A dimension of 17th Century history that those of both the triumphalist and the elegiac perspective overlook is the extent to which that history was born out of disorder (Shapin 1998: 123-126; Tarnas 2000: 275-276; Porter 2000: 25-31; Toulmin 1990: 15-18). Shapin describes the 17th Century as an era of almost "permanent crisis", principally bought about by:

- The breakdown of feudal order and changing notions about the nature of political order.
- The rise of the nation state.
- The development of printing with the prospect of wider dissemination of knowledge.
- The fragmentation of religious order, with consequent erosion of social order, evident in the religious wars (Shapin 1998: 123-125).

Bordo (1987: 13) suggests that the loss of the 'one true church' in Europe was pivotal in eroding one important source of authority that helped maintain a certain form of social order. In addition, expanding commerce bought knowledge of new and different cultures, chipping

away at certainty about Eurocentric views of the world. Furthermore, the development of technology such as the telescope undermined faith in the 'naked senses' as the means of gaining knowledge about the world, while the Copernican revolution inverted the smug certainty that the earth was the centre of the universe. Given the multifaceted and profound epistemological shake up caused by these events, it is not surprising that the guiding theme of Descartes *Meditations* was doubt (Bordo 1987:14).

As Bordo concluded, Descartes vision is underpinned by a loss of faith in 'our' epistemic processes, not surprisingly so in light of the history he had witnessed (Bordo 1987: 17). Shapin is correct in saying that 17th Century intellectuals were as concerned as any intellectuals with generating knowledge for its own sake. Nevertheless, he also concludes that the English and European crisis was the stage on which the relationship between knowledge and state power and social order was played out (Shapin 1998: 125). Fear of 'intellectual and moral chaos' spawned 'Cartesian anxiety'. The fear of error and all sources of error underlay much of Descartes' thought. Bordo argues that Descartes "…*Meditations* be read as a mirror of that culture, a reflection both of its anxieties and its responses to those anxieties" (Bordo 1986: 440). Stephen Toulmin argues that far from being 'ivy tower' thinkers speculating on abstract issues far removed from the concerns of daily life, 17th Century thinkers were consumed by the problems of their day. He concludes that, "…Modern Science and Philosophy …(were)…responses to a contemporary crisis" (Toulmin 1990: 16).

In the first half of the 17th Century, England and many parts of Europe were in a state of crisis, politically, religiously and economically (Toulmin 1990: 17). The years between 1620 and 1650 were, in Hill's assessment, 'bad' (1972: 86). Food prices increased, wages failed to keep pace, taxation was heavy and the cost of living increased (Hill 1972: 86). Political and religious dissent and division characterized England. It endured a civil war. Liberalism, as articulated by Locke in *Two Treatises on Government*, was a sustained attack on the theory of the divine right of Kings. The divine right of Kings was asserted, while Diggers and Levellers promulgated what were, for the time, radically democratic doctrines. Dissident opinion was often greeted with imprisonment or death (Ashley 1967; Hill 1972). The publication of an ostensibly innocuous, a-political tract like *De Motu Cordis* was delayed because Harvey feared the kind of reception it would be given (Magner 1992).

The potential for social disorder was recognized by the Puritans who shored up the ideology of the ill disciplined, feckless poor, but urged greater charity on the part of the wealthy to

ameliorate the poverty the 'lower orders' of England experienced (Ashley 1967: 23-25). Toulmin points how the changing economic order threatened social order:

> In the 16th and 17th centuries, the clear threat to social stability and loyalty was seen as the growing number of "masterless men" (sic): not merely vagrants, but those people (e.g., printers and charcoal burners) whose ways of life did not attach them securely to the vertical chains to reciprocal obligation that had been constitutive of traditional society (Toulmin 1990: 96).

In this light, the Cartesian emphasis on certain and unassailable knowledge becomes understandable. Says Toulmin, "If Europeans were to avoid falling into a sceptical morass, they had, it seemed, to find *something* to be certain about (1990: 55: emphasis in original). England in particular was strife riven, fractured by political and religious dissent. John Locke despairingly described, "…this great bedlam England" (quoted in Porter 2000: 24). Porter concludes that:

> …Newtonian cosmology afforded the perfect paradigm for a modern, stable, harmonious Christian polity ruled by law, not caprice …(it) was recruited to bolster the new constitutional order against its foes (Porter 2000: 32).

The culture of modernity

Charles Taylor (1995: 24) argues that there are two ways of understanding modernity; the cultural and the more hegemonic a-cultural understanding. The cultural understanding, preferred by Taylor, regards the difference between pre-modern and modern society as a difference of civilizations, each with different cultures. By contrast, the a-cultural perspective holds that the change from pre-modernity to modernity entails, "…loss of belief" (Taylor 1995: 26). For some, this loss is positive, representing emergence from the shade of superstition into the light of rationality, individualism unhampered by claims of tradition and authority, together with the establishment of clear and certain knowledge by a demarcation of fact from value. This is what I would deem the Whig account of the development of modernity. Others mourn this loss as a denial of transcendent vision, as the ungluing of meaningful connection with others and with the world and also as false independence from 'God', or other religious notions. This perspective aligns with what I have deemed the 'elegiac' account of modernity that is overwhelming characterized by disenchantment. What is missing in both accounts, according to Taylor, is:

> …the possibility that Western modernity might be powered by its own positive visions of the good, that is, by one constellation of the good….by its original spiritual vision….(1995: 26).

Taylor (1995) also takes this cultural perspective in relation to modern science, challenging the view that it is either value free fact (Whig version) or instrumentally iconoclastic smashing all meaning in its advance (the Elegiac account). Science is a value-laden enterprise, sustaining a particular cosmology, in his view. As he puts it, "…science itself has grown in the West in close symbiosis with a certain…understanding of person, nature, society, and the good" (Taylor 1995: 27). What differentiates modern sensibility from the pre-modern one is not our explicit beliefs but the background beliefs on which explicit beliefs rest, according to Taylor (1995). Explicit beliefs (doctrines as Taylor terms them) are relatively easily articulated but are only held in relation to a set of unformulated understandings that make them meaningful; principally these relate to understandings of what constitutes 'the good' (Taylor 1995:28). What Cartesian epistemology achieved, in Taylor's view, was the suppression of backgrounded knowledge (1995: 32). It didn't cease to exist, but it did become largely invisible.

Taylor's model recalls Douglas's assertion about the background knowledge on which foreground knowledge (explicit doctrines, in Taylor's parlance) rests. Hence the core concepts of modernity—rationality, truth and science—should, if Douglas (1975) and Taylor (1995) are correct, rest on knowledge that is less open and overt. Douglas suggests that every culture and its cosmology construct a list of dangers to its classification system that must be hidden if the system is not to be under perpetual challenge. My hypothesis is that the column on the left- hand side of the following table is not permanently displaced as the elegiac school suggests or 'conquered' as the Whig version holds, but is backgrounded because it is dangerous and threatening.

Table 2.4: Foregrounded and backgrounded aspects of modernist classification

Backgrounded Knowledge	**Foregrounded Knowledge**
Nature	Culture
Body	Mind
Subject	Object
Matter	Spirit
Rhetoric	Positivist Language
Non-Science	Science

Accordingly, in re-examining the key concepts that emerged and solidified during the 17th Century, they push dangerous, threatening elements into the background, evading explicit awareness of them. Amidst the dogmatism of thought in the 17th Century, the fear that

pervaded it can be discerned in what was de-valued and the attempts to render them relatively invisible. Notwithstanding Descartes' affirmation of nature as mechanical and Bacon's injunction to subdue it, it remained a source of unease in much 17th Century thought. Suspicion about the potentially anarchic qualities of nature was isomorphic with fear of the body and its irrational propensities. Unease concerning nature and the body, found expression in fear of women and in attempts to control them and thus de-fuse the threat they posed.

NATURE, BODIES AND WOMEN

Notwithstanding the bellicose attitudes expressed about nature as an inert mechanical form, in the Cartesian tradition, and that could be controlled and exploited, in the Baconian one, fear about its decadent and anarchic qualities are evident in much 17th Century writing. Fear of 'the fall' and the incomplete dominion of rationality in securing order in the world are apparent even in Bacon's strident affirmation that nature should be harnessed and exploited. The fall was a constant refrain in 17th Century thinking and writing (Thomas 1983: 17-20; Tarnas 2000: 231; Merchant 1990: 131). It served as a kind of obverse utopia, reminding civilized people of the chaos and depravity from which they had emerged but into which they risked perpetual re-descent.

Nature was, as a consequence of the fall, in a state of decay and was an obstacle to human progress (Thomas 1983: 17-18). For Bacon, as for many of his contemporaries, 'the fall' represented loss of dominion over nature and 'new science' represented humanity's chance to reassert control; it was not therefore mere opportunity but moral imperative. "Matter", Bacon warned, "is not devoid of an appetite and inclination to dissolve the world and fall back into the old chaos" (quoted in Merchant 1990: 171). It was, after all, a "common harlot". Knowledge, expressed in technological exploitation of the natural world would restore, "…man's dominion…to their promised bounds". While Bacon is either lauded or excoriated for his pivotal role in transforming nature into an object to be conquered, his attitude to it displays considerable ambiguity and ambivalence. In his own words, nature:

> …is either free and follows her ordinary course of development as in the heavens, in the animal and vegetable creation, and in the general array of the universe; or she is driven our of her ordinary course by the perverseness, insolence, and forwardness of matter and violence of impediments, as in the case of monsters; or lastly, she is put in constraint, molded, and made as it were new by art and the hand of man…(quoted in Merchant 1990: 170).

Nature, unless controlled, could be perverse, insolent and violent. Bacon's contemporaries and those writing later in the century embraced his truculent attitude to nature. Domination over nature was a sign of God's will and became a yardstick of progress.

Fear of nature entailed fear of the body and this was translated into fear about women. Women were regarded as little better than 'savages' (Thomas 1983; Merchant 1990). In particular, women's allegedly insatiable sexuality threatened the social order and men within it. Burton's *Anatomy of Melancholy* (1621) warned that even old women, "…must have a stallion, a champion; she must and will marry again and betroth herself to some young man" (quoted in Merchant 1990: 132). A popular tract on sex of the era charged young women with a determined quest to lose their virginity as soon as possible (Merchant 1990: 133). Women's sexuality became a thing to be feared, threatening to weaken and enslave men. John Donne articulated the spectacle of women enthralling and enervating men through the symbol of Adam and Eve:

> For that marriage was our funerall:
> One woman at one blow, then kill'd us all.
> And singly, one by one, they kill us now.
> We doe delightfully our selves allow
> To that consumption; and profusely blinde,
> Wee kill ourselves to propagate our kind
> (quoted in Merchant 1990: 133).

The persecution of witches during this period is an extreme manifestation of the fear associated with this view of femininity. Early in the 17th Century, laws were passed in England allowing the persecution of women deemed witches (Ashley 1967 38-39). Not surprisingly, given the fear of the feminine, accusations against women presumed to be witches were couched in overtly sexual terms, often changing intercourse with the Devil. Overwhelmingly witches were women (by a ratio of 50:1) and were drawn from those lower down the social scale. Says Merchant "The control and maintenance of the social order and women's place within it was one of the many and varied reasons for the witch trials" (1990: 138). Given the increasingly prominent scientific and medical view of women, their status as witches is understandable, if not quite forgivable. Weyer, a prominent medical authority of the time, opined that women were more vulnerable to the wiles of the devil because of their greater melancholy (that had a basis in bodily humors), giving them a greater tendency to become prey to emotions and false beliefs (Merchant 1990: 141).

The fear of women was one dimension of fear of disorder expressed in the 17th Century. Men, in the lofty words of the Earl of Halifax in the latter part of the 17th Century, "…were to be lawgivers (because they) had the larger share of reason bestow'd upon them" (Porter 2000: 322). Not only did women lack the necessary quality of reason, their neurological systems made them less capable of exercising control over their impulses (Porter 2000: 328-9). Some women were beginning to comment on a gender order they believed unjust and to call for greater equality, although it was not a widespread movement, as far as conventional historical sources reveal. Aphra Ben, the 17th Century English novelist and playwright, for instance, produced works calling for women to have access to education and to enter marriage freely, rather than as a commodity their fathers might profitably sell to a well-placed bidder (Spender 1992: 35-40). While gender inequality was a fact of life, it was not grounded in a supposedly immutable biological basis. However, it was ironically enough the birth of ostensibly universal norms or egalitarianism that gave birth to the grounding of innate differences between the sexes and the justification of gendered inequality (Laqueur 1990). The radicals of the 17th Century, such as Hobbes and Locke, insisted in their tirade against monarchical rule that political and social order was grounded in convention, not natural right. However, as Porter (2000) and Laqueur (1990) have noted, if order were mere convention, how is it to be sustained?

Religion and science together were employed to shore up the belief in women's inferiority and their 'natural' subservience to men. Men, after all were spirit and pure activity while women were matter and passive. Women as flesh were naturally subservient to men as spirit. In the words of Scottish theologian John Knox, God's ordained order could be seen even in the animal kingdom:

> For nature hath in all beasts printed a certain mark of domination in the male and a certain subjection in the female which they keep inviolate. For no man ever saw the lion make obedience and stoop before the lioness….(quoted in Merchant 1990: 145).

Science and medicine shored up men's dominance by grounding supposed differences between men and women in the 'objective' domain of nature (Martin 1989: 27-35). Laqueur among others (Porter 2000: 328) notes that until the end of the 17th Century the notion of men's and women's bodies being fundamentally different did not exist. Prior to this period, it had been held that while men's bodies were the norm, women's bodies had the same 'parts', but that they were merely differently organized. The vagina was a kind of inverted penis and ovaries internally located testicles (Lacquer 1990; Martin 1989: 28-29). A fourth century

bishop asserted that, "…women have the same genitals as men, except that theirs are inside the body and not outside it" (quoted in Martin 1989: 27). Men possessed more heat than women and were thus superior (Martin 1989: 30). Even biologically unique processes, such as menstruation, allegedly had analogues in processes undergone by men. While women excreted impurities with menstrual blood, men did this via perspiration (Martin 1989: 31). However, by the latter part of the 17th Century, medical science was asserting a radical difference between the bodies of men and women, and on this basis a fundamental difference in the 'nature' and relevant social roles of each gender (Lacquer 1990; Martin 1989).

Science, by grounding gender inequality in 'nature' and in women's flawed bodies and psyches, provided an apparently unassailable justification. Hence, fear of women, and also of the body and the natural world, was allegedly quelled by 'objective' scientific knowledge. However, this does not mean that the fear was vanquished, merely that it was backgrounded.

CONCLUSION

The point of this detour from Durkheim's theory of religion into aspects of seventeenth history and revisionist interpretations of that history was to suggest, contra the triumphalist versions of modernity, that it was a response to crisis. My argument is that the fear of disorder that spawned so much of the intellectual and empirical activity of the period has become a perpetual ghost of modernity; those fears have not been vanquished or completely assuaged. They continue to haunt modernist thinking and to drive much of the activity it gives rise to. My quarrel with the 'elegaic' interpretation is that it denies the values that drove and continue to drive modernist intellectual activity. Any intellectual framework that fears disorder and chaos is driven by values, seeking order, security and progress and holding these as positive values. Douglas' (1975) anthropological perspective, building on Durkheim's theory of religion, suggests that fear of chaos and disorder and a quest for harmony and security is endemic to any culture's cosmology and that the 'battle' between these opposing forces may be conceptualized as a tension between sacred and profane.

Chapters four and five consider the role of metaphor in biomedical thought about cancer and coronary heart disease and consider what values they 'smuggle' into biomedical knowledge. More specifically, if Durkheim is right that biomedicine can be considered a secular religion, can the presence of sacred and profane be discerned in biomedical thinking about these two common ailments? However, prior to this analysis, Chapter three outlines my epistemology and methods in undertaking this analysis.

Chapter 3

Telling stories: methodology and methods

Unlike puppets we have the possibility of stopping in our movements, looking up and perceiving the machinery by which we have been moved. In this act lies the first step toward freedom (Peter Berger 1976).

…grasp the interplay of man (sic) and society, of biography and history, of self and world (C Wright Mills 1977).

I'm telling you stories. Trust me (Jeanette Winterson 1988).

I offer these quotes as epigraphs because they capture my concerns in this Chapter. The quotation from Berger articulates epistemological concerns. I accept there is an object world that influences me, but I also accept that its properties do not dictate my understanding of, or response to, it. The world acts on us and we act on it; this is what constitutes the possibility of freedom. Mills words encapsulates my methodological approach in suggesting the need examine the dynamic interplay between structures and the complex synthesis of historical and social forces captured in the concept of the 'individual' who interprets his or her world and acts within and on it. Jeanette Winterson's plea may seem 'left of field', but, when stripped bare, conducting and reporting research is about telling stories. I will tell how and why I did my research, how I constructed a story out of it and, I hope, give reasons to trust my story.

This chapter describes my epistemological assumptions and methodological practices in undertaking a thematic analysis of biomedical educational and popular texts on cancer and coronary heart disease. It proceeds in five parts. In the first section I outline epistemological debates and my own position in relation to those debates. The second part considers methodological concepts in relation to my own research. I then tell my story, outlining what I did and why. Fourthly, other works that have employed similar research methods on related topics, or addressed similar questions, are discussed. In the final section, I briefly discuss the work of Kuhn (1970) and Fleck (1979) and point out the utility of their frameworks for analyzing medical knowledge.

BACKGROUND AND EPISTEMOLOGICAL FRAMEWORK

Biographical information provides a background through which this chapter is best understood. My undergraduate training was in history and anthropology during the 1970s. My recollection is that history depended on selection; one could never 'tell the whole truth' and those events deemed 'historical' did not occur because of great men pushing and pulling us inexorably to 'progress'. Structural forces produced what we call history. But the actual details of doing history, its methods, were not much discussed. One simply constructed a good argument (story), appropriately supported with evidence; contrary pieces of evidence and counter arguments had, of course, to be accounted for. The anthropological works I read described their field work in the broadest of terms, but detailed description of what researchers did, how and why was rarely offered. As for what constituted data that, too, seemed self-evident; documents, observation, listening, talking, as well as the interpretation of these phenomena were data. Telling good and convincing stories seemed, and still seem, like a reasonable motif for research.

I then left the academy, taking up nursing, learning about stories and language in different ways, in a radically different setting. Returning to university in the early 1990s and encountering a new discipline (sociology) proved a shock. Within sociology, methodological detail and rationales abounded, often, in my opinion, at the expense of theoretical detail and rationale. Sociology often seems to make a fetish of research methods. The often-acrimonious debate between qualitative and quantitative researchers spawned incredulity on my part; my academic background made qualitative work 'normal', while quantitative research seemed problematic, marginal and of dubious worth. I responded to the debate with all the sophistication of a neophyte; quantitative methods were bad, qualitative ones were good. I took my simplistic rendition of the epistemological and research world to my work in an academic department of public health. My (mostly) quantitative colleagues showed considerable courage in giving me responsibility for the Research Methods course in the Master of Public Health program. My students in this course were often from scientific and biomedical backgrounds and while open to the potential of qualitative approaches encountered great difficulty in seeing how it could constitute 'research', according to their canon. I began to include lectures on the epistemological bases of both qualitative and quantitative research to help them understand what constituted 'knowledge' and 'research'. The discussions with students about this material began to challenge my own epistemological and theoretical preconceptions of that time, encapsulated in the following table:

Table 3.1: My initial perception of theory and method

Research Type	**Quantitative Methods (implied)**	**Qualitative Methods (implied)**
Epistemological basis	Positivism	Verstehen
Research Domain	Object World	Subject World
Research Focus	Macro sociological	Micro sociological

I came from an epistemological tradition that took it for granted that reality was constructed, not discovered. I was encountering, what was for me, the unsettling possibility that there was a world 'out there'. It was this possibility, rather than the world being 'constructed', that was a novel, disrupting one. At the same time as I experienced this 'epistemological doubt' because of my teaching, I was working with epidemiologists who obviously were concerned with quantification, precision and prediction, yet, some of whom, could reflect on the presuppositions they bought to their work and how they helped construct their data. Strongly quantitative they were, naively positivist they were not. These experiences started to scramble my neat cleavage of the world into 'non-positivist, meaningful' research (qualitative methods) and 'positivist, meaningless' (quantitative methods). My easy, unthinking association of quantitative methods with positivism and of qualitative methods with anti-positivism gradually eroded. I encountered quantitative work that was reflexive about its assumptions

and the way it put its data together, while I also came across qualitative work that assumed it had encountered a truth beyond the contaminating influence of the researcher. Naive positivism seemed to inhere in the researcher rather than in the style of research.

Working with epidemiologists and biostatisticians also began to demonstrate for me the value, indeed the necessity, of quantitative work. My approach to what constituted 'good' and valuable research became increasingly eclectic. I still frequently criticize quantitative research for the way it seeks sanitized variables, isolated from the contaminating complexity of the context in which they exist and operate, as well as for the way it often presumes to have discovered a truth that has meaning beyond time and particular contexts. However, I no longer see these tendencies as intrinsic to quantitative research. While these qualities are still all too frequently associated with quantitative work, they are not *ipso facto* a part of it. Increasingly, I came to appreciate sophisticated, non-positivist quantitative work and recognize that it yields things qualitative work cannot. I rarely do quantitative work, since I have neither skill nor interest in this field, but I no longer simply dismiss it as a domain of inquiry. The following table documents my current perception:

Table 3.2: My 'transformed' perception of theory and method

Research Type	**Quantitative Methods (need not necessarily imply)**	**Qualitative Methods (need not necessarily imply)**
Epistemological basis	Positivism	Interpretive theory
Research Domain	Object World	Subject World
Research Focus	Macro sociological	Micro sociological

This thesis is embedded in qualitative research and is critical of naïve positivism, yet I am also sceptical about the sociological premises and epistemological assumptions underlying much phenomenological sociology. While I empathize with its insistence on the subjective and meaningful dimensions of life, I am impatient with its seeming inability to regard these as 'macro' factors, not just inter-subjective creations. Meaning does not just reside at the level of individuals; culture is a structure of meanings, a systematic pattern of more or less coherent values, beliefs, knowledges, symbols and rituals (Wuthnow et al 1984: 3-7). I also find much interpretive sociology's neglect of the 'object world', whether it is disease or social structure, problematic. As Rosenberg said in the early days of the AIDS epidemic, it is hard to ignore the biological properties of a disease that has an almost 100% fatality rate (Rosenberg (1992: 260). Similarly, it is difficult to dismiss social structure given the seemingly intractable link between socio-economic status and health status (Marmot et al 1997; Davey Smith 2000). Disease and social structure exist; we name them and interpret them but they are external

influences on our thought, belief and behaviour. Marx's famous argument sums up this kind of sensibility:

> Men (sic) make their own history, but they do not make it just as they please; they do not make it under circumstances chosen by themselves, but under circumstances directly encountered, given and transmitted from the past (quoted in McClellan 1986: 43).

My own epistemological position recognizes the existence of an object world but also recognizes that this is known through interpretive practices rather than ostensibly value free and a-theoretical observation. Translating this somewhat abstract philosophical statement into a more grounded sociological one, I recognize that 'objective' structures influence our perception, thought and action. However, those structures do not by their properties determine the meaning(s) imputed to them; we are not *tabula rasa* on which the object world inscribes its qualities and properties. We interpret our world, render it meaningful and in so doing, 'construct' it. We also believe in things that are not directly apparent to our senses and these beliefs also influence our action. An exclusively objectivist view of the world, or one that gives priority to interpretive practices, ignores the complexity of 'reality' and ignores the way objectivity and subjectivity interact with and mutually constitute each other. I agree with David Silverman's assessment that, "…social science may be interpretive while still recognizing the power of social structures' (Silverman 1984: 30).

Short (1991) suggests that the positivist separation of the subject from the object world invalidates forms of inquiry that seek to critically evaluate knowledge and confines issues of meaning to individual subjectivity. Interpretive sociology, particularly in its phenomenological guise, also separates subjectivity and the object world. Its focus on subjectivity excludes any interaction with the object world, thus excluding causal analysis. Critical theory offers something of a rapprochement between these poles of inquiry. As Short says, "For critical sociology, though, the conception of sociology as an interpretive discipline is dependent on, and not logically distinct from, causal analysis" (Short 1991: 21). Peter Berger (1976), whose quote is an epigraph for this chapter, writes that we can look at the 'machinery' that 'moves' us and in understanding it we can begin to loosen its power over us. We cannot escape structures, (we would barely be social creatures without them), but we can understand them, and, in understanding them, we are less puppet like in their grip.

In this respect, Habermas's typology of knowledge seems a fruitful one. There are, as Habermas observes, social forces that are to some extent external to us and that 'constrain' the

capacity for thought and action. Yet, as human beings we can be reflexive about such forces and the more we are able to understand them, the less constraint they exercise over us. Hence, in Habermas's view, there are three dimensions to knowledge, expressed in the following table:

Table 3.3: Habermas on social domains, forms of knowledge and types of inquiry

Social Domains	Form of knowledge	Types of inquiry
'External', 'structural' factors	Prediction and control	Empirical, analytic sciences Usually quantitative methods
Reflexivity	Understanding of meaning	Historical, hermeneutic studies Usually qualitative methods
Domination	Emancipatory	Critical theory

(Adapted from Giddens 1990: 127)

The study of metaphor crystallizes much of the previous discussion. Metaphors are self evidently human creations, yet I suggest they exist as 'structure' apart from individuals. A quick reading of the literature on HIV /AIDS will confirm how powerful disease metaphors can be, how they can constrain people in roles and identities that may be welcomed or unwanted. The metaphors enmeshing HIV/ AIDS are also inseparable from other social structures such as racism, homophobia, sexism and inequality (Treichler 1999; Sontag 1989). Thus we need causal analysis to understand the origins and effects of metaphor. We cannot escape metaphor; it is a condition of thought and part of culture. Metaphors are both a structure and a meaning. We think 'inside' them and they are a key part of the way we understand our world and find it meaningful; they are machinery that moves us and they are, simultaneously, machinery that we use to make sense of and construct our world. When, however, we understand the historical origins of specific metaphors and the cultural resonance that gives them such power we begin to understand how and whey they operate and this loosens their power over us. When, for instance, it is recognized that the body as a machine is a metaphor that might serve the interests of biomedicine better than it does the interests of women (Martin 1989), or men (Edwards 1992), or sufferers of chronic pain (Frank 1993), the possibility of resistance is opened. This is the emancipatory function of critical theory. The meaning of the metaphor changes for us, as does the way we use it to understand and construct our world.

A word about 'truth'

Elucidating the metaphorical dimension of biomedical knowledge contradicts the crude positivist presumption that biomedical knowledge provides an unmediated mirror on 'nature', making it 'True Knowledge', beyond dispute and, importantly, beyond evaluation. The old

joke, “You can’t have an opinion about the truth”, articulates this positivist sensibility. To suggest that knowledge is formulated in given contexts and doesn’t have an existence apart from them is to invite the charge of relativism, which is seen to undo the possibility of truth (Bury 1986). The presence of metaphor in medical knowledge shows its interpretive and socially constructed nature. Does this mean medical knowledge is not true? No, not necessarily. The influence of context on knowledge has proved problematic for both positivists and constructionists. To assert that medical knowledge is not ‘true’ because of the presence of metaphor, (an interpretive, symbolic practice) is to imply that ‘true knowledge’ has an existence beyond human beings and their interpretive practices. As Tesh argues this objectivist position itself stems from a set of cultural assumptions and values:

> The identification of “true” knowledge with objective knowledge is part of a general dualistic world view in which mind and body, fact and value, reason and emotion, and so on are polar opposites (Tesh 1990: 174).

Positivism, in its crude, scientistic form, is actually nonsensical. To follow its canons is to have no knowledge because knowledge, by definition, can only be known by a knowing person, whose very existence mitigates ‘objectivity’. I accept that ‘our’ understanding of, say, the appendix is culturally and historically contingent. Yet, if suffering an inflamed appendix, I would consult a doctor; contingency does not automatically negate the ‘truth’ or ‘usefulness’ of knowledge.

Many constructionists point to the hole in the positivist position and then fall into it themselves. Having laid out the constructed nature of the biomedical knowledge they describe, they also then call its truth into question. As King points out, to assert that constructed knowledge is not true is to reassert that true knowledge must be context free (King 1987). As King says:

> What we regard as truth also requires social enterprise if it is to become part of our reality….Demonstration of the social roots of ….anything…is a way of understanding it, not grounds *per se* for its indictment (King 1987: 361).

To call into the question the truth of knowledge demonstrated to be socially constructed is, in effect, to re-inscribe the fact-value distinction. The presence of values, of subjectivity, in knowledge does not undo the possibility of ‘truth’ or ‘knowledge’. Again, Tesh is instructive:

> The only reason one would throw out facts, on the basis that they include values, would be if one believed that value are entirely personal and it is impossible to discriminate among them. It would be more logical to assume that, just as values hide within facts, so facts hide within values (Tesh 1990: 174).

METHODOLOGICAL CONCEPTS AND PRACTICE

When translated into methodological terms, the dichotomous privileging of either structure or meaning suggests a rapprochement of realism and interpretive sociology, through 'critical realism', seems both tenable and desirable. Bhaskar defines 'realism' as recognizing the "…role of 'meaning' in social life without accepting that this dissolved the constraining power of social structures" (Bhaskar 1979: 45-46). Interpretive sociology is, however, to be heeded for highlighting that not all social action can be explained by pointing to the effects of social structure (Silverman 1985: 29). Bhaskar (1979) popularized the term 'realism' in attempting to find a rapprochement between 'structural' perspectives and those schools interested in subjectivity, symbolism and meaning. The realist epistemology advocated by Bhaskar holds that society (as a structure) is not a product of agency; it is an a-priori structure that provides a context for social action. However, agency has reality in that it acts within and on society, reproducing or changing it. Moreover, while society pre-exists agents, it has no existence apart from them (Bhaskar 1979: 45-46). Ussher and Mooney-Somers (2000) define critical realism as an affirmation of the existence of:

> …reality, both material, psychological and environmental, but at the same time recognizes that this experience is always mediated by culture, language and political interests rooted in factors such as sexuality, race, gender or social class (2000: 184).

Much qualitative research is based on a theoretical critique of positivism's insistence that there can be separation of subject (researcher) and object (the issue being researched) and that the object world has an objective existence that can be discovered through rigorous research techniques that exclude the subjectivity of the researcher. I accept that there is no un-mediated access to this object world. My theoretical assumptions, my value orientation and my subjectivity (Anglo-Saxon, middle class, well-educated, woman, ex-oncology nurse) will influence what I see; the subject never stands separated from the object world. Equally, subjectivity does not cancel the object world. In pondering the object world, I accept it has an existence apart from me and while I produce an account of it that is inseparable from my

identity and my concerns, I try to remain faithful to the qualities of the object world, in this case biomedical knowledge and its metaphors. By interpreting, I tell a story, but it has to be a story the reader can trust and I must offer reasons inviting trust.

The line between 'discovering' the metaphors embedded in these texts and 'interpreting' them into existence is thin, blurred and difficult to sustain. At one level, I did not fabricate the metaphors I discuss; the notion of cells acting 'rebelliously', for example, is there in the texts. However, I came to these texts with an understanding of the complex relationship between individuals and social order through years of reading anthropology, history and, then, sociology. Would I have seen the notion of 'rebellious' cancer cells as a metaphor of the individual—society relationship without that background? Certainly, a friend, whose training is in medicine, literally could not see the metaphorical association between cells, individuals, and bodily and social order; she stared, transfixed with incredulity, as I outlined their parallels. Her theoretical lens simply did not bring this possibility into focus. I saw that metaphor because I had a framework that enabled me to glimpse it. Having once caught sight of it, I came to see more of it, in greater detail. The data and theoretical framework simply reinforced one another. At that time, I spent long periods scrutinizing biomedical writings on cancer and heart disease, but would then feel I needed to know more about particular aspects of 17th Century history, to more fully understand the biomedical material I was reading. I would then return to the biomedical texts with an enlarged and more detailed theoretical framework influencing what I 'saw' in those texts. 'Data collection' and 'interpretation' are not distinct and separate activities. Enough ink and paper has been spent trying to define the demarcating line between them and to keep them in separate domains and I do not intend to retrace the ground and shore up the demarcation. I regard 'discovery' and 'interpretation', like the supposed fact-value distinction, as mutually constitutive activities rather than opposed endeavours.

Reliability and validity

Two concepts dominate research methodology in the social sciences, 'reliability' and 'validity'. Reliability refers to accuracy of measurement through a stable, error free measurement tool. A method is said to be reliable if it repeatedly yields the same results, even in different settings or if different researchers use it (Sarantakos 1994: 74-75; Burns 1995: 217). Statistical tests of significance between variables are a reliable measure; applying the same statistical tests to the same raw scores should produce the same results, no matter who does them, at what point in time, or in which particular setting. Generally speaking, reliability

is a gold standard in quantitative research but exercises less sway in qualitative research, because issues of perception, meaning and interpretation and are less easy to standardize than variables. In addition, reliability is primarily concerned with precision and replicability not meaning. As Burns says, "It is possible to study reliability without inquiring into the meaning of the variables" (1995: 217). If I had conducted a content analysis of biomedical writings on cancer and CHD, its reliability would have been verifiable by someone else scrutinizing the same documents and counting the number of times certain key words appeared. It would have told us nothing about the meaning of those words, however, much less about how they form a coherent conceptual system and they way this fits into the wider culture. Given the intimate inter-weaving of theory and data collection, this thesis would not score highly as a 'reliable' piece of research. Other researchers would not come up with 'my results' because they would bring a different biography, different value orientations and a different theoretical lens to this task.

Validity concerns the extent to which a tool measures what it is intended to measure (Sarantakos 1994: 74). Or, using Grbich's less militantly mathematical language, validity refers to the researchers' access to and accurate representation of the social world they seek to study (1999: 59). Validity is much more central to qualitative research because it assesses the extent to which one actually studies the 'real' quality or dimensions of phenomena. Have I validly represented the social world of biomedical knowledge, set out in the texts I examined? At the level of 'mere language', I offer numerous words and longer quotations to suggest that I am validly representing the language and concepts employed in this body of knowledge. However, this begs the question about whether my intent is to faithfully interpret the intentions of these authors; I do not see my task as faithful reproduction. I should not distort or misrepresent the writings that are my data, but my task is more than to merely mirror them. My task is to uncover the metaphorical structure of the concepts and knowledge embodied in these writings and then to inquire into their power by identifying their resonance with the wider cultural setting in which they exist. My attempt at 'validity' is not about faithfully capturing the intentions of the authors, since I am looking for a sub-text in their work of which they may be unaware. They write as experts in biomedical knowledge, not as authors of a 'cultural script', which is my interest. Does this mean that I have invalidly represented the metaphor of cells as deviant individuals, or CHD as economic disruption? Discerning these metaphors is a matter of theoretical interpretation rather of methodological validity. These metaphors are not in the text, I 'created' them through theoretical reflection and interpretation. I can only offer evidence that I have not misrepresented the texts I consulted and that my theoretical inferences are justifiable.

I question whether traditional definitions of 'validity' apply to this thesis. I suggest Grbich (1999: 60-65) criteria of dependability, credibility and justifiability are more appropriate ones. Given these criteria, I will demonstrate that the inferences I take from my data are dependable, credible and justifiable. I will achieve this by showing that the concepts I discuss are really 'there' in the material I consulted and that my method of identifying and analysing them is dependable. The issues of credibility and justifiability will be addressed by showing how my interpretation of these metaphors is embedded in and compatible with a wider theoretical framework. Given that I was using Douglas' (1978) argument that the social body always conditions the perception of the physical body, another check on the validity of the metaphors I was discovering and interpreting into existence was their resonance or parallels with 'objective' social conditions. The notion of the body as a differentiated hierarchy articulating a division of labour had clear parallels with 'objective' social structure. Observations such as these also added weight to the point that metaphor is not merely an issue of linguistic style but is part of a coherent conceptual scheme isomorphic with social practice and structures. Others see these parallels, though they focus on different elements of those structures and processes.

THE STORY: WHAT I DID AND WHY

I chose cancer and coronary heart disease as case studies for a number of reasons. My experience as an oncology nurse gave me 'insider' knowledge about the 'weight' of words and their symbolic resonance. Listening to my students' work about CHD made me aware that this was one disease that was ostensibly free of metaphorical encumbrance; it was apparently characterized by literal, true knowledge. Sontag's *Illness as Metaphor* discussed both of these diseases in ways that directly contradicted my own theoretical 'hunches' and would give me a constant reference point for my own thinking. Finally, cancer and coronary heart disease are both important public health issues, so I would be dealing with 'mainstream' diseases, not obscure ones whose existence or significance was debated.

An important question was whether biomedical language was free of metaphor, as Sontag (1987) suggested. The obvious way to answer that was to investigate the nature of biomedical language concerning cancer and CHD. I could have interviewed cardiologists and oncologists, but decided against this option for a number of reasons. Firstly, social science of the decidedly 'soft' sort I practice is not highly regarded among some medical practitioners. The interviews would necessarily have been long ones and I wondered whether I would get enough respondents to agree to interview for a project about which some of them would have been, at

best, dubious. Secondly, it may have been a difficult task for biomedical practitioners to reflect on the nature and significance of the metaphorical nature of biomedical language, especially when it is accepted as 'truth'. (If somebody had asked me to ruminate on the metaphorical nature of sociological language, I would not have been confident that I could have offered a sensible response, 'off the top of my head'. One hopes that I could respond more readily after the experience of this thesis). I would probably have spent as much of the interview time explaining that language is metaphorical than in hearing freely voiced observations about the place of metaphor in biomedical language. These considerations suggested that interviews might not generate useful data.

Aside from these practical issues, there was a theoretical reason for not doing interviews. Reading authors such as Ortony (1993:1-16) and Lakoff and Johnson (1980: 3-9) persuaded me that metaphor was not just a matter of language; it was implicated in the structure of thought and communication, and therefore of knowledge. Asking people to reflect on the metaphorical nature of not just the language, but the very knowledge they utilized seemed too difficult a task to ask of them. In addition, I needed to understand the conceptual frameworks in which cancer and coronary heart disease are understood and defined. Such coherence was best gleaned from texts than from interview data that would have probably only sketched parts of this framework. The best way to analyse the nature of medical knowledge about cancer and CHD was to read what practitioners in these fields wrote about them. There were books written for the general public by such specialists explaining the 'normal' function of the cell and the heart, how and why cancer and CHD developed and the forms of treatment available for both ailments. These publications would provide an account of biomedical knowledge about these two complaints. However, I realized that it might be argued that such books employed metaphor as a means of describing concepts that were often complex and esoteric to an audience unfamiliar with them. In this case, it might be argued that metaphor was not intrinsic to the knowledge but was merely a rhetorical device to describe biomedical knowledge to a public not well versed in it. I was therefore concerned not merely to identify language that was metaphorical but to investigate whether the key concepts constituting medical knowledge of these two ailments were metaphors. To adequately investigate this argument, I needed to read books written by specialists for their peers, or for medical students being inducted into this esoteric body of knowledge. If these communications had metaphors embedded in them, it seemed more likely that the metaphors were embedded in the knowledge itself, and were not merely linguistic artifact overlaying a substratum of literal, non-metaphoric knowledge.

Furthermore, in asking whether metaphor is embedded in knowledge, not just language, and how that links to the wider cultural context, I needed to examine not just particular ideas, such as 'the cell' or 'cholesterol'. If from Mary Douglas's (1978: 93) assumption that the social body shapes the perception of the physical body was true, the body had to be understood as a total system, reflecting the 'total system' of society. Insights into the credibility of Douglas's assumption was most likely to be gained from texts that systematically examined and explained bodily anatomy, physiology and pathophysiology.

I identified texts for analysis by consulting published listings of texts available on particular topics. In addition, I took the more pragmatic route of scanning the medical library of the university where I then worked. A primary excluding criteria was that I had to understand the material I was reading. A nursing qualification gave me a certain competence in understanding biomedical writing. However, that knowledge was not as highly developed and technically advanced as that of senior medical undergraduates and post graduate students, much less medical academics. If I could not understand a text, its sub-text was not available to me. It was partly for this reason that I also did not consult specialist publications, dealing with 'cutting edge' topics in oncology or cardiology. I consulted texts written for undergraduate students, as well as newly graduated practitioners and for the general public. I also analysed texts written for nurses and other health professionals. I turned to more specialist, 'advanced' material only when I felt I needed to know more about a particular concept, such as 'immunological surveillance', for instance, which led me to read Burnett (1976). This range of texts gave me sufficient opportunity to discern whether metaphorical concepts framed knowledge, or was merely a linguistic gloss on essentially non-metaphorical knowledge. I verified the accuracy of my understanding of biomedical knowledge by subjecting my accounts of cancer and CHD to a friend who is a pathologist by training and patient by temperament.[1]

I scrutinized texts that spanned a range of time. This was necessary because there was change in emphasis in the literature on cancer from immunology to molecular biology over time. The change needed to be tracked and understood. In addition, the knowledge about CHD changed throughout the course of the 20th century. This thesis is not a history of either cancer or CHD, however the sociology of neither can be adequately understood without reference to aspects of their changing history. As my theoretical framework became more coherent, it became apparent that an understanding of prevailing 17th Century medical understandings of cancer and the heart (heart disease, as 'we' understand it, did not exist) was necessary. Hence, I read

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some of the (translated) primary documents of the time, such as William Harvey's *De Motu Cordis* (1957). Additionally, socio-historical secondary works were consulted, as well as more conventional medical histories of the 'great men leading us out of superstition to Knowledge' genre.

I started with a core group of texts about cancer and coronary heart disease, designed for undergraduates in medicine and other health professions or newly graduated practitioners. These were gleaned from perusing the undergraduate curricula of South Australian universities offering health profession degrees, primarily in nursing and medicine. These allowed me to identify key metaphors that were then adopted as analytical tools to 'interrogate' other texts. From these core texts, I moved the span of my analysis out in two ways. Firstly, I canvassed more specialist texts on particular topics as well as analysing more populist literature on the topic. Secondly I broadened the time span of the publications I had consulted. This proved necessary because it was clear that shifts in emphasis had occurred, such as that from immunology to molecular biology in the case of cancer. Searching the catalogue of the university library using particular key words identified these texts. Where possible, I tried to include a range of texts from American, British and Australian sources to ensure that they were representative of the state of accepted knowledge at any one time.

In some ways questions of the 'representativeness' of the texts I examined are contradictions in terms. Textbooks embody what is by consensus regarded as a corpus of knowledge that is 'the truth' and what all potential practitioners must know to operate effectively in their professional sphere. Because texts embody what, in Kuhn's (1970) terms constitute 'normal' science, they don't embody substantially different material. As such, medical and nursing texts are one of the few areas where the cliché 'seen one, seen them all' has any validity. There is virtually unanimous agreement about anatomy, physiology and pathophysiololgy in these texts. Questions about their representativeness do not arise since they encapsulate the undisputed truth at any one time. Disputes in biomedical science usually involved highly specialized knowledge. As such, they are confined to particular topics, particularly 'cutting edge' ones, and are most likely to be aired in arcane, specialist journals, beyond the ken of undergraduate students, the general public and sociological researchers. Fleck (1979) makes the point that scientific knowledge can be visualized as lying in a set of concentric circles. The most esoteric knowledge is located n the inner most circle; it is knowledge that is somewhat provisional and is the subject of debate. As one moves through the circles toward the outer one, the knowledge in them is accepted as less contentious and is subject to less debate. The knowledge in the outer most circle is accepted uncritically as true and generates

consensus rather than debate. This is the knowledge that is found in texts written for undergraduates and the general public.[2]

Furthermore, the disputes I encountered were mainly in the domain of epidemiology rather than clinical knowledge or practice. There are minority viewpoints, such as that of Skrabanek (1990), challenging the role of cholesterol in the development of CHD, or Barker's work suggesting that events in utero are the primary determinants of the onset of CHD in later life (Barker et al 1993). Samuel Epstein (1992: 455-462), Bailar and Smith (1986: 1221-1232), and Bailar and Gornick (1997), on one side, and Sir Richard Doll (1991: 675-688), on the other, have conducted a vigorous debate about whether the incidence of cancer is decreasing, about whether medicine is responding more effectively in its treatment of cancer and the role environmental factors play in its onset. These debates represent quarrels about ''ultimate causation' rather than the mechanisms of disease and as such are not the point of interest in this thesis.

I immersed myself in these texts and 'interrogated' them at a number of levels. The language employed in them, particularly highly evocative or pejorative terms such as 'selfish cells', was one point of interest, since it was a clue about the obvious presence of metaphor. The general understanding of the body was also crucial, since this shaped the way diseases are framed. Finally, I wanted to understand the knowledge about both diseases, not just as a series of isolated concepts, but as coherent conceptual frameworks. Key metaphors were identified reasonably quickly and I read until 'saturation', that is until I was not discovering significantly new concepts or metaphors (Sarantakos 1994:141). Having identified the key metaphors, their historical location and sociological significance could be explored. Lupton (1992: 145) terms this procedure 'discourse analysis'. However, I prefer the term thematic analysis (Daly, Kellehear and Gliksman 1997: 134) because it is less interwoven with disputes about modernist and postmodernist views of language and truth. As Lupton points out 'discourse/ thematic' analyses has two components. The first component examines the style and content of the text. Hence, I looked for the presence of metaphors, noting their style. Were they, for instance, emotive, pejorative or relatively pedestrian? I also considered the content of the texts I consulted. What information did they contain about either cancer or coronary heart disease, what kind of conceptual framework did they establish as a way of understanding the disease and what sort of model of the body was contained within them? The second component of 'discourse/thematic analysis' requires identifying the relationship of the

[2] I accept that occasionally a controversial account of a disease may be published. I did not consult any text in this vein.

text with the social, political and cultural context in which it is produced, disseminated and consumed (Lupton 1992: 145).

OTHER'S ANALYSES OF METAPHOR IN BIOMEDICAL KNOWLEDGE OF DISEASE

By the 1980s the status of biomedical knowledge was being considered by diverse theoretical schools in the social sciences; anthropology, sociology, feminism, history and cultural studies made prime contributions. Notwithstanding the diversity of this scholarship, it converged around two themes; how concepts of disease shaped the relationship between the medical profession and the wider society and how disease shifted from being viewed as unalterable biological entity to a socially negotiated one (Rosenberg 1992; 259). As Rosenberg says, "This marriage of cultural criticism and antipositivism became an influential, if never a majority, view during the past generation" (1992: 260).

The label 'social constructionism', though it is imputes undue unity to the diversity of practitioners who had the label applied to them or abrogated it for themselves, produced a range of accounts documenting the socially constructed character of biomedical knowledge of disease. Figlio's classic essays showed how the disease categories of 'miner's nystagamus' (Figlio 1982) and 'chlorosis' (Figlio 1985) emerged as ways of mediating class relationships. Feminists working within broadly defined constructionist parameters made some of the most incisive contributions to identifying the patriarchal values permeating medical knowledge about women's ailments and responses to them (see for example Martin 1989; Jordanova 1989; Ehrenreich and English 1979). These studies illustrated that medicine, including medical knowledge, was 'not separate from the social' (Wright and Treacher 1982). However, the role of metaphor in the construction of that knowledge was not generally theorized in most of these works.

Because there have been relatively few studies that examined the role of metaphor in the constitution of medical knowledge I will discuss them in some detail. Perhaps not insignificantly, they have, by and large, come from disciplines other than sociology and are thus not grounded in the hypothetico-deductive method of inquiry. (While I acknowledge that not all sociological inquiry proceeds from this tradition, it has, until recently, exercised dominance as the 'gold standard' of rigorous research (Daly, Kellehear and Gliksman 1997: 171). For the most part, the studies I cite have relied on interviews as well as documentary sources and participant observation and, as such, their work is comparable to mine in only limited ways. However none of the studies I cite gives a great amount of detail on their

research methods, especially from the standpoint of sociology that in extreme cases fetishizes research methods. Hence, I take the compatibility of the theoretical insights of these authors with my own conclusions as indicating the 'validity' of my own work and interpretation. This will be the centrepiece of the following discussion. I will devote most of the discussion to Martin's work since it is closest to mine in method and theoretical intent.

Emily Martin's *The Woman in the Body* (1989) was one of the first works to systematically examine the role of metaphor in biomedical knowledge and it remains one of the best. Writing within a sophisticated, yet mainstream, Marxist framework, with a feminist sensibility, Martin was concerned to describe and analyse women's alienation within the domain of biomedicine. As part of the structure and processes of capitalism biomedicine would necessarily reflect its concerns and interests. Martin wanted to consider the way women's experience was affected by medical definition of their anatomies and physiologies (1989:5). She suggests that biomedicine is a key body of knowledge and social institution implicated in the fragmentation of women's identity and experience because of the way it defines women. However, biomedicine cannot be separated from wider social structures and processes, as well as dominant epistemology. Conceptualizing the body as a machine separate from emotions or relationships, for example, is one way women's wholeness and unity of experience is denied. Moreover, because of its 'scientific' status, with its connotations of value-free truth, medicine contributes to women's alienation by 'naturalizing' social structure and processes. In looking at the metaphors embedded in biomedical knowledge, Martin teases out how they mediate social structure and relationships, particularly the emphasis on patterns of production, and biomedical knowledge. From the start, Martin's theory is guiding the kinds of things she searches for and identifies as significant. A non-Marxist would have considered very different things and a male Marxist scholar may have also accentuated different aspects of capitalist production and division of social space and biomedical knowledge. The points of this observation is that research methods cannot meaningfully be considered apart from theoretical concerns and presumptions. In addition, the experience and identity (ies) of the researcher cannot be divorced from the conduct of research.

Martin investigated these issues by examining texts embodying biomedical knowledge and then by interviewing a diverse group of women about how they defined and responded to the issues addressed by biomedical knowledge and practice. Unfortunately, Martin gives greater detail to the methodological details of conducting interviews with her research 'subjects' than on how she selected and analysed the biomedical literature that was such a key part of her work. Martin focused on texts used for teaching in hospitals and handbooks that are used as

practice guides. Hence, like me, she concentrated on 'texts' (used in a strict sense) that encapsulate what is taken as the unproblematic truth within any one discipline at any one point in time. Martin wanted to uncover the 'grammar' used by biomedicine, by which I take it she means the deep-seated rules that shape the formulation and use of biomedical knowledge. Ethnomethodologists studied 'grammar' as social phenomena. Garfinkel's famous 'demonstrations', in which people ignored the usual rules and conventions of conversation, showed how dependent particular concepts were on context (1967).

Martin began with an historical perspective on the way biomedical knowledge regards the bodies of men and women. Historical studies can undermine or challenge an a priori assumption about the 'truth' of knowledge and make its contextualized and contingent nature apparent. An historical perspective allowed Martin to chart the relationship between changing social conditions, especially relations of production, and changing biomedical knowledge. New social circumstances, she found, generated new metaphors (1989: 32). What Martin is doing is identifying concepts she finds in textbooks, as well as those of a more populist orientation, but rather than treating them as isolated concepts she links them into a coherent framework in which they make sense not just within biomedical knowledge, but within the wider culture. Martin thus demonstrates that metaphors are not merely linguistic practice; they are coherent conceptual systems, isomorphic with other systems. The metaphors that help constitute biomedical knowledge reflect, in Martin's opinion, the social organization of capitalism that depend on mechanical production and allocate women to the private sphere. Not surprisingly, for a Marxist scholar looking at medical texts written in a capitalist culture, the motif of production runs through biomedical accounts of women's anatomy and physiology. Menstruation, for example, is construed as failed production. I reproduce part of a description of menstruation from a college text cited by Martin:

> If fertilization and pregnancy do not occur, the corpus luteum *degenerates* and the levels of estrogens and progesterone *decline.* As the levels of these hormones *decrease* and their stimulatory effects are *withdrawn,* blood vessels of the endometrium undergo prolonged spasms (contractions) that *reduce* the bloodflow to the areas of the endometrium supplied by the vessels. The resulting *lack* of blood causes the tissues of the effected region to *degenerate.* After some time, the vessels relax, which allows blood to flow through them again…This blood and the *deteriorating* endometrium tissue are discharged from the uterus as the menstrual flow (quoted in Martin 1989: 47; my emphasis).

Martin cites a number of other biomedical accounts, but what unites them is the motif of menstruation as lack, as decline, as a kind of cyclical senescence. Terms taken from other texts cited by Martin include ‘ceasing’, ‘denuding’, ‘losing’ and ‘dying’ (1989: 48). Given the interpretation of the event as catastrophic it is remarkable that most women survive the monthly event. As a check on the validity of her own interpretation that menstruation is depicted as unproductive pathology, Martin turned to descriptions of male reproductive physiology. Spermatogenesis could be described as wasted production of Olympian proportions, given that a single ejaculation contains about 250 million sperm (Miller and Keane 1978: 939). However, it is described in terms of heroic productivity rather than profligate over production and waste:

> The mechanisms which guide the remarkable cellular transformation from spermatid to mature sperm remain uncertain…Perhaps the most amazing characteristic of spermatogenesis is its sheer magnitude: the normal human male may manufacture several hundred million sperm per day (quoted in Martin (1989: 48).

Could it be, asks Martin, that menstruation is, in some objective sense, atrophy and loss (1989: 49)? Another form of checking on the validity of her interpretation is to consider biomedical descriptions of analogous bodily processes that are common to men and women. The lining of the stomach, for instance, is regularly disposed of and replaced, in the same way as the endometrium of the uterus by menstruation is. The texts Martin consulted referred primarily to the way the stomach wall is protected from its own digestive secretions by a lining of mucous cells. It is not mentioned that these mucous cells must continually be sloughed off, digested and replaced. Menstruation is routinely described as disintegration, yet only specialized medical texts described the change in the stomach lining as ‘sloughing’ and ‘renewal’. While more specialist medical texts used the terms ‘sloughing’ and ‘renewal’, the thread common to all texts is that menstruation is described in negative terms, while men’s or those that are generally gender neutral physiological processes are described in positive ones (Martin 1989: 50).

Other assumptions lurk behind the negative metaphors of menstruation as failed production. The first is that the state of non–pregnancy is not desirable. Yet, women often regard menstruation positively, as a sign that they are not pregnant; it could therefore, as Martin suggests, be couched in a celebratory vein. Frequently, part of women’s relief over not being pregnant is that they can continue labour force participation. The ‘failure’ motif framing biomedical discussion of menstruation suggests that women’s participation in the public

sphere is less ‘natural’ than having children and the retreat to the private sphere it often entails.

Economistic and mechanistic tropes also pervade the biomedical definition of childbirth. Labour is characterized as having ‘stages’ that can quantified with Fordist time and motion precision and provide, “… a good measure of the overall efficiency of the machine”, in the words of one obstetrician (Martin 1989: 59). The first stage of labour, defined by the extent of the cervix’s, should occur at 0.6 centimetres / hour; the middle phases should also occur at 0.6 cm / hour, while later stages should proceed at 1.2 cm/ hour. Women to some extent are rendered passive entities in the birth process, since most texts stress the involuntary nature of uterine contraction. Yet, at various times, they may be told to push harder, or not to push. Two refrains are evident: uterus as machine, women as labourers. However, despite the invocation of women as needing to work, or not, as part of their labour, it is the doctor who “manages” labour and decides on the pace at which it should proceed.

Menopause likewise is construed as pathologically unproductive; even so august a body as the World Health Organization declared that menopause was the “burning out” of ovaries. One 1965 text cautioned:

> In the past few years there has been a radical change in viewpoint and some would regard the menopause as a possible pathological state rather than a physiological one and discuss therapeutic prevention rather than amelioration of symptoms (Quoted in Martin 1989:51).

The significance of Martin’s work in *The Woman in the Body* is its demonstration of the way biomedical knowledge is constituted through systematic metaphors. It is not that terms that are ‘colourful’, ‘evocative’ or ‘evaluative’ find their way into writing that is otherwise aridly ‘scientific’. Notions of hierarchy, of productivity, of work, drawn from the social structure and cultural values of the setting in which Martin lives, are significant influences on the way biomedicine frames explanations of our the way bodies work. As Mary Douglas puts it, the social body constrains the way the physical body is perceived (Douglas 1978: 12-14). By examining biomedical texts, as well as popular works expounding medical knowledge, Martin shows that metaphor, contra Sontag, is built into medical knowledge, not a distortion of it. This observation supports my theoretical framework and my empirical findings.

In another essay, Martin sought to elucidate the metaphors of the immune system, in popular and scientific discussion asking, “What social world is visualized within them” (1990: 67-

76)? In addition, Martin sought to tease out the 'ideological functions' of those metaphors and to consider if there were alternative ways of conceptualizing immune systems. I will not discuss the ideological function of metaphors or alternative conceptualizations since they are not relevant to a discussion, or evaluation of, the methods I have used in considering metaphors in biomedical knowledge.

Martin consulted the following data sources:

- Articles on the immune system published in major mass media publications for the past 5 years. These included 'mainstream' magazines such as *Time* and *Newsweek*, as well as more specialized, though still populist, scientific publications, such as *National Geographic* and *Discover*.
- All the book-length popular publications on the immune system identified through standard bibliographic search techniques; ten were identified in this way. While Martin does not quote from them all, the metaphors were ubiquitous.
- A year's fieldwork in a university department of immunology, including fieldwork with a research group.
- All the texts required or recommended in graduate courses in 'her' department of immunology, as well as required or recommended texts for graduate and undergraduate students on immunology set by another division in the university.

The most salient image is of the body as, metaphorically, a 'regulatory communications network'. Boundaries within bodies are fluid, but there is a rigid self (individual body) and non-self (the external environment) distinction, in which 'non-self' is foreign and hostile. The confrontation between self and non-self is depicted in terms of ruthless battle; indeed, the body becomes the site of 'total war' between invaders and immune system (Martin 1990: 410-411). Martin documents combative imagery that would rival Hollywood for detailed and gratuitous violence; "… perforate hostile organisms", "lives trickle to a halt", "multitudes fall in battle", "holes form where the protein molecules hit" (Martin 1990: 412). Another metaphor, equally dependent on tropes of violent conflict, is the body as 'police state', using intelligence and "vast criminal records" to detect 'foreigners', by seeking "proof of identity". The body, like the police state, has administrative apparatus as well as field personnel to aid this work, including "technical colleges" and "training sites" (Martin 1990: 412-413)

What is the relationship between populist and specialized, technical, scientific publications, asks Martin? While the subject needs more research, in her opinion, "…at a general level, it is clear that popular accounts often simply take the metaphors that occur in scientific writing a

few paces further" (Martin 1990: 413). Hence my hypothesis that metaphor in biomedical writing is intrinsic to the knowledge, not merely a rhetorical device making it intelligible for a lay audience, is supported by Martin's work. However, several 'sub-metaphors' were evident in the more specialized literature and related to, "… social forms pervasive in our time" (Martin 1990: 414). Accordingly, Martin lists a number of metaphors evident in the biomedical literature she consulted and shows their parallels with observations made about the structure and operation of contemporary forms of social organization. While the role of mutual communication is underscored in the immune system, Anderson (1983) and Gellner (1983) stress the importance of language for inclusion in economic and moral communities. Within the immune system, cells in blood and lymph circulate freely throughout the body. Within the modern nation state individuals are "…fluid and mobile, and they are unmediated…." (Gellner (1983) quoted in Martin 1990: 415). The immune system is not conceptualized as under the control of a central organ, instead being a "biologic democracy" (quoted in Martin 1990: 415). Anderson suggests that nation states have a potentially egalitarian dimension in that internal hierarchies are flattened in the face of national identity (Anderson (1983) quoted in Martin 1990: 415).

However, both the nation state and the immune system are revealed to have 'suppressed hierarchies'. Nationalism, for example, downplays the virtues of difference and often converts racism to a suppressed hierarchy (quoted in Martin 1990: 415). However, there is privilege in the immune system too. Phagocytes (cells that digest other cells) are less evolved in evolutionist terms and are even found in worms, while "Killer T cells" stem from a higher evolutionary order with advanced functions, such as memory (quoted in Martin 1990: 416). Common to both the nation state and the immune system is a gendered overlay on this hierarchical division of labour. Killer T cells 'penetrate' their adversaries while macrophages capture their opponents through "invagination" (quoted in Martin 1990: 416). When not engaged invaginating their enemies, macrophages behave peacefully by busying themselves with "housekeeping" (quoted in Martin 1990: 416).

Montgomery's work (1991) considers the place of metaphor in biomedical knowledge in general, rather than focusing on a particular bodily system or disease. Drawing on Nietschke, he points out that some metaphors acquire status as literal truth over time. Many of the most widely accepted and taken for granted concepts in the canon of biomedical knowledge originated outside biomedicine and were incorporated by biomedicine, according to Montgomery: an argument supported by other sources (Temkin 1977). Scott points out that Harvey metaphorically imported the notion of the circulation of the blood into medicine. The

concept of circulation came to Harvey as much from watching the action of newly developed pumps as it did from existing medical knowledge (Montgomery 1991: 343) Harvey was relatively open about the metaphorical musing that gave rise to his discovery, "I began to think whether there might not be a motion, as it were, in a circle" (quoted in Montgomery 1991: 343). The circulation metaphor has long since been accepted as a literal truth, with about the same status as the theory of gravity. Montgomery contends that metaphors are successfully incorporated into theory and accepted as truth if they expand on dominant 'image systems'. In Montgomery's words, "…disease is not *like* these (metaphorical) systems and their related terms, it *is* them, insamuch as it is a concept whose existence depends on expression" (1991: 345; emphasis in original). To say a knowledge claim or body of theory is metaphorical does not, as Montgomery points out, obviate the concept of 'Truth'. As Montgomery says "To understand the construction of knowledge, it is necessary to accept that it is 'knowledge' (1991: 346).

Montgomery's essay had three intentions:

1. To identify the two dominant metaphorical systems in biomedical thought.
2. To identify the metaphors underpinning the discourse of alternative medicine.
3. To examine the historical context in which these older and more pervasive image systems (Montgomery's term for metaphor) came into biomedical discourse (Montgomery 1991: 345).

To fulfill these intentions, Montgomery turned to the following sources of data:

- Popular journals that report biomedical and scientific issues, such as *National Geographic.*
- The Flexner report of 1910 that helped establish the standards and parameters of medical education in North America.
- Specialist scientific journals such as *Nature.*

The reigning 'image system', or metaphor, for all disease, in non-specialist and specialist publications, as well as the Flexner report, is war. However in more specialized discourse, two further metaphors are apparent: combat and militarism (bio-militarism), on the one hand, and information processing, on the other (bio-informationism). The computer is the model for the latter and conceptualizes the body as a network for, "…production, transfer and appropriation of 'data' (Montgomery 1991: 353).

How does biomedical knowledge operate in everyday life? The bio-information model of the body relies on two basic images, 'the book' and the 'map'. These metaphors, in Montgomery's view, 'translate' or link the metaphors of technical discourse with the arena of 'ordinary' human experience. Temkin made a similar observation about the functioning of metaphor in biomedical discourse in observing that technical, biomedical discourse achieves a kind of transcendence by linking technical concepts with wider cultural constructs (Temkin 1977). It is popularly assumed, and Sontag (1987) amplified the assumption, that this linking or translation of technical concepts and wider cultural images corrupts technical discourse. This assumption rests on one of its own; the existence of an arcadian, or protean, non-metaphorical biomedical language that has simply taken on metaphors to communicate to those outside the circle of technical language and knowledge. However, as Montgomery (1991) and several historians of medicine observe (Temkin 1977; Miller 1978), biomedical knowledge has always drawn on concepts from outside its own disciplinary boundaries and formulations. Non–specialist accounts of specialist knowledge, as would appear in *National Geographic* for example, do not create a new, overtly metaphorical discourse to communicate to their readers, they draw, instead, almost entirely on technical language and knowledge (Montgomery 1991: 353).

I will not discuss Montgomery's account of the constitution of 'alternative' medical knowledge, since this thesis is not concerned with those 'alternatives'. I turn now to Montgomery's discussion of the historical circumstances in which the two dominant metaphors of biomedical knowledge—bio-militarism and bio-information—were framed. Bio-militarism, conceptualizing disease as war and the body as battleground, comes from the idea that disease is an invader and gained great currency during the time Pasteur's work gained popularity. Given the success of 'germ theory', it was a metaphor with enormous intellectual and political purchase. However, Pasteur was not a 'great scientific mind' working in isolation from the ideas of his time. While not denigrating his contribution to biomedical knowledge, Pasteur merely gave clearest expression to ideas being developed and tested by many others of his time. The notions of 'invasion', 'battle' and 'resistance' cannot meaningfully be separated from the rise of the nation state, conceptualized as an organic entity, during the 1860s and 1870s, and from the perceived, and actual, threat that foreigners could invade it (Montgomery 1991).

'Bio-information' is a post-1953 product of the 'discovery' of DNA. As with Pasteur, Watson and Crick 'put a ribbon' around a lot of similar work being done at the time. According to Watson and Crick, DNA facilitated the reproduction of genetic information. As with other

'successful' metaphors, it found a resonance with other concepts of the time and by the 1970s the concepts of 'coding / de-coding' and 'transcription / translation' had, "…become the discourse of genetics as a whole…." (Montgomery 1991: 368). The origins of the 'research programme' that gave rise to Watson's and Crick's work lay in attempts to 'crack' the Enigma code during the Second World War. The attempt to 'break the genetic code' had strong affinities with Cold War espionage and counter espionage (Montgomery 1991: 368-369).

While bio-militarism is explicitly combative, the language and concepts of 'bio-information' contain a more subtle bellicosity. It is still predicated on the concept of combat, but in scenarios invoking 'codes' rather than 'foreign invaders'. Montgomery discerns several versions of combat in 'bio-information':

1. Disease as conflict between existing codes.
2. Disease as conflict involved in code making and breaking.
3. Disease as an attack on normal modes of information processing.
4. Disease as a form of war over possession and control of command codes in the body.

Every view of disease is a view of both the body and society, says Montgomery (1991: 377); a view Douglas suggested two decades ago (1978). The notion of disease as struggle is tied to Foucault's argument about the 'appearance of man' (sic), in which a variety of disciplines created the idea of 'the individual' and of competition between individuals (Montgomery 1991). However, it depended on the notion of the 'organic' applied to persons (bodies) and societies. Bio-information, however, depends on non-organic analogies, particularly society as computer and the body as an information processing entity. Information Technology is now the fundamental organizing principle of biomedical knowledge.

Martin's work following *The Woman in the Body* (1989) examines the metaphorical framing of medical knowledge about immunology. Her theoretical perspective in these essays incorporates insights from Foucault's work, namely, that concepts and practices related to the body often reveal concepts of power operating in that context. Modern power created and depended upon 'docile bodies'. However, with a discernible, if not yet clarified and agreed upon, contemporary change in capitalism, are forms of power changing? One way of characterizing contemporary capitalism is the emphasis on 'flexible accumulation', accentuating the need for qualities like:

- Technological innovation.
- Specificity.
- Rapid, flexible change and production.
- Emphasis on problem solving.
- Adaptable skills (Martin 1993: 68).

What are the effects of these changes for workers? What kinds of power are exercised on contemporary bodies and how does this power operate? What kinds of bodies are needed and valued? Martin seeks to link these questions with observation from 'fieldwork' in a department of immunology and with organizations concerned with care of people with AIDS (1993: 70).

Martin's data sources for investigating these questions were:

- The 'ground rounds' of a department of immunology and infectious disease.
- US companies 'experiential learning' programs.
- A 'medical' text, "A History of Immunology".
- Popular health manuals and home health books from the 1920s to the 1960's (1993: 70-71).

Martin does not indicate her selection criteria for her data sources, nor the method of analysis, though she does explain the reason for choosing her sources of data. Her field-work took place in the immunology and infectious disease department suggested that, in this setting, a functional body was one capable of, "Agile response, flexible specificity… poised to meet any conceivable challenge" (1993: 71). This portrayal seemed to parallel economic changes demanding " flexible accumulation, frequent retraining, and geographical mobility on a global basis" (Martin 1993: 71). To see whether this "agile, flexible, specific" body was a recent metaphor, Martin examined popular health manuals and home health books from the 1920s through to the 1960s when 'docile bodies' would have populated sites like factories. Martin also attended "experiential learning' courses that US corporations sponsored for their employees to facilitate their "empowered learning" (Martin 1993: 73).

In analyzing the health manuals and home health books, Martin looked for 'central metaphors' related to health. During the twentieth century there has been a progression from emphasis on 'passive' immunity, where a pathogen itself produces immunity in an otherwise inert host, to its 'active' production. 'Active immunity' involves the host in producing an immune response. A third, quite recent, concept to emerge is that of 'immunological

specificity' designed to respond to a cornucopia of antibodies. At the turn of the 20th Century, threats to health lurked in the environment, externally, and the emphasis was on 'hygiene'. With time, attention turned to defenses within the body, most obviously during the 1960s and 1970s. In contemporary health and biology books the interior of the body has been enormously elaborated. This constitutes an increasing shift of emphasis on the external environment as a threat toward an otherwise functional body to one that highlights the internal capacity of bodies to respond to a seemingly increasing and uncertain array of threats, both external and internal (Martin 1993: 71-72).

Martin's fieldwork in the immunology department's 'ground rounds' revealed that the 'cases' presented deviated from the culturally valued norm of the white, middle class, adult male. Considering the parallel of the ideal body of immunology and the ideal worker for the 'new' economy, Martin concludes, " The bleakest consequence of these new models of the ideal body would be that, yet again, certain categories of people–women, people of colour–will be found wanting" (Martin 1993: 74).

Though Martin's theoretical framework has shifted from an orthodox Marxist one to a framework that owes much to Foucault, her prime manoeuvre is unchanged. In looking at the metaphors built into medical knowledge she again tries to trace the connection between disease metaphors and profound aspects of social life.

Weiss's (1997) is one of the few works to link coronary heart disease and metaphors. Her work, like that of Martin and Montgomery, proceeds from the assumption that social paradigms are metaphorically articulated through bodies. Because of this, she argues that disease and illness are important components of the symbolism associated with the body. However, while negative judgments are thickly clustered around cancer and AIDS and those who suffer them, in Weiss's view "The imagery of heart disease, in contrast, is largely underdeveloped". (1997: 458) Says Weiss, "All in all, heart disease–unlike AIDS or cancer–has remained largely free of social and political imagery" (1997: 458). I disagree with her assessment. I will argue that the notion of the heart as a pump, while not an overtly pejorative metaphor, is nevertheless embedded within a particular political understanding of what constitutes rational agency. This will be discussed at greater length in Chapters Five.

While Weiss's work is closer in intent to mine in that she undertook a comparative study of metaphor in different diseases—AIDS, cancer and coronary heart disease—she did not

consult documentary sources. Her theoretical interests may be similar to mine, however our methods are not comparable. Weiss undertook her analysis by completing interviews with:

- 40 doctors.
- 75 nurses.
- 60 graduate and undergraduate university students.

Her interpretation of the data focused on 'pattern recognition' of recurrent themes and underlying patterns and she sought to identify common symbolic structures within the data as a whole. Cancer, Weiss found, was characterized overwhelmingly by transformation, especially via the power of contamination. Cancer was also equated with an animal that was protean and devouring. The self became transformed, she found, because it was diminished and effaced by the 'progress' of the cancer. If cancer was characterized by contamination, AIDS was similarly construed as pollution. However, it had no centre, in the way cancer was reckoned to have, and was therefore equated with total invasion. As Weiss says:

> In AIDS, pollution (infected body fluids) transforms the body /self. In cancer, transformation (cells transformed into a malignant tumor) pollutes the body by spreading, migrating, and infecting other tissues. The two diseases are almost looking-glass reflections of one another, constituted in the same symbolic space. Pollution transforms, transformation pollutes (1997: 464).

When respondents were asked to provide imagery about heart disease in the same way as they had for AIDS and cancer, most focused on heart attack. "Their metaphors of heart attack contained a different emotive quality than their metaphors of cancer or AIDS" (Weiss 1997: 467). In much the same way I had found, metaphors for heart attack were more pragmatic, less emotionally loaded, and not as sad or anxiety ridden compared to metaphors of AIDS and cancer. Additionally, visual metaphors evoked by heart attack were concrete while those of AIDS and cancer were "metaphysical" (Weiss 1997: 467). Heart disease was conceptualized as very specific and localized, " and expressed a sense of certainty about its course, nature and behaviour that was not expressed in their metaphors about AIDS and cancer (Weiss 1997: 467).

Coronary heart disease was typically described in prosaic terms, as "… problems in plumbing". However, unlike cancer and coronary heart disease, Weiss' respondents did not describe it as contaminating, or altering self (1997: 468). Indeed, one respondent articulated a very Cartesian view of the body affected by coronary heart disease; the heart is simply a

machine. Weiss remarks that: “These mechanical depictions of the heart may seem surprising in light of the heart’s long standing position as the center of emotions” (1997: 468).

The deconstruction of self, or ambiguity over self, characterizing persons with AIDS or cancer is a post modern phenomenon, in the opinion of Weiss. The metaphors of AIDS and cancer, on the one hand, and heart disease, on the other hand, suggest different models of the body. The body of heart attack is a machine with Fordist precision; it is the body of ‘classic capitalism’. The bodies of AIDS and cancer, by contrast, are those of late capitalism. It is a body surrounded by and containing rapid, flexible change; AIDS and cancer are underpinned by globalization; it is an inter connected system, with polluted boundaries between self and non-self. In Weiss’s assessment, “Just as heart attack is the pathology of the Fordist body, AIDS and cancer are pathologies of the postmodern body in late capitalism” (1997: 470).

Weiss’s (1997) work in important to this thesis in that it considers the metaphorical dimensions of a disease not normally associated with metaphor, that is coronary heart disease. It is also important in that it attempts a comparison of disease metaphors, something that is also rarely done in a single body of work. However, her work does not strictly examine the role of biomedical thought in the formulation and dissemination of these metaphors and as such her work is not strictly comparable with mine. Weiss makes it clear that different diseases are imbued with different metaphors. However, by not considering those metaphors within a single understanding of the body, that of biomedical knowledge, she cannot explain the significance of these differences for our understanding of biomedical knowledge and its relation to metaphor.

PARADIGMS AND THOUGHT STYLES IN THE HISTORY OF MEDICINE

The work of Martin (1989; 1990; 1993), Montgomery (1991) and Weiss (1997) points to the way knowledge of the body and of disease have parallels with the configuration and function of the society in which they are located. These observations are relevant because they confirm Durkheim’s argument in *The Elementary Forms of the Religious Life* (1965) that categories of thought, including those of science, are socially and culturally constructed. Moreover, this suggests the utility of Fleck’s (1979; 1981) concept of ‘thought styles’ and of Kuhn’s (1970) notion of ‘normal science’. Kuhn’s work, widely known through *The Structure of Scientific Revolutions,* demonstrates that what constitutes scientific knowledge at any one time is conventional in that it gains acceptance as the paradigm of ‘normal science’. ‘Normal science’ is the prevailing paradigm that stipulates what counts as knowledge, what the relevant

theoretical questions are and what the research program should be. In Kuhn's view, there are always anomalies; that is empirical or theoretical insights that are not fully explained by the prevailing paradigms. However, it is the solution to these insights that constitutes the activity of 'normal science' within that paradigm. Eventually the anomalies cannot be explained, or accumulate, and issue a challenge to the prevailing paradigm for which it cannot offer a satisfactory account. The old paradigm crumbles and a new one emerges, capable of providing a framework for accommodating the questions and insights that were anomalous within the old paradigm. The revolutionary insight of Kuhn's work was that it demonstrated the way paradigms condition what can be seen, in a literal sense, as both legitimate theory and empirical datum.

Despite the justified impact of Kuhn's work on the history and sociology of science, his work is sociologically unsophisticated. Kuhn's account of paradigm development and change is centred on knowledge within the paradigm. He does not give much consideration to the role of social and cultural factors in shaping and changing paradigms. The work of Ludwig Fleck, from which much of Kuhn's is derived, is more sociologically grounded in that he refers to 'thought styles', analogous to Kuhn's notion of paradigms, but links them to 'thought collectives' (Harwood 1986: 174-175). Fleck articulates how thought styles condition perception and interpretation of what is perceived by pointing out that they constitute "…the readiness for directed perception and appropriate assimilation of what has been perceived" (Fleck 1979: 142). However, Fleck also links thought styles to thought collectives that are particular groups of people associated with particular fields of knowledge or practice. Hence, Fleck goes further than Kuhn to consider not just the knowledge within the boundaries of any one thought style (or 'paradigm' in Kuhn's framework), but how the social location of people affects their activity within and response to a thought style. Moreover, he embeds that thought within a wider context than merely the thought style and thought collective. In addition to being members of a specialist thought collective, individuals are members of other thought collectives and bring the assumptions and values of those collectives to their work within scientific ones (Fleck 1979).

Hence Fleck's work is more sociological than Kuhn's in its account of the formulation and change of scientific knowledge (Harwood 1986: 179-181). Moreover, Fleck had an embryonic awareness of the role of metaphor in guiding the concerns and themes of thought styles. As Harwood argues, Fleck understood that the presuppositions of a thought style stem from non-rational commitment to metaphors that themselves embody ontological and epistemological assumptions (1986: 179-181). His history of the Wasserman test for syphilis, for example,

found the medico-scientific knowledge about syphilis embedded within lay knowledge, religious beliefs and non-scientific imagery. (Fleck 1979: 35-45). Thus Fleck, while historically prior to Kuhn, offers some significant advances on the latters thought. Fleck's perspective shows how symbolic, cultural factors outside the thought style and thought collective influenced what was seen within it. Fleck also developed an embryonic sociology of the Gestalt nature of scientific observation.

Fleck's work presages that of Mary Douglas (1978) in some respects, particularly in observing that cultural and social frameworks are decisive in influencing what is seen when looking at 'nature'. Science, far from requiring observation free from pre-suppositions, actually depends on them. In a direct refutation of positivism, Fleck suggests:

> In the last resort what is, and how it is, observed therefore depends on our entire culture… It must be assumed that the observation of distinct objects is possible only on the basis of preconceived opinions. An empty mind cannot see at all. (Fleck 1981: 247).

What has been under-theorized in the paradigmatic or thought style approach to scientific knowledge is the role of metaphor in constructing those thought styles and paradigms. Chapters four and five consider the roles of metaphor in the formation of medical knowledge regarding cancer and coronary heart disease, respectively.

Chapter **4**

Cancer: the fragility of order

Cancer cells are very much alive. They have a lust for life and for their own reproduction, but they are a form of life that is totally selfish, unconcerned with the well being of the organism within which they dwell. They divide and reproduce themselves without orderly or specific purpose, invading neighbouring tissues and organs…They show a total contempt for the right of other cells to accomplish their task without interference: if they are not stopped in their destructive course their uncontrolled proliferation will result in the death of the carrier organism (Victor Richards 1972).

…the capacity for self management is decisively coded as male. By contrast, all those bodily spontaneities—hunger, sexuality, the emotions—seen as needful of containment and control have been culturally constructed and coded as female…Women's desires are by their very nature excessive, irrational, threatening to erupt and challenge the patriarchal order (Susan Bordo 1995).

This chapter contains five sections. In the first section I sketch the framework for the understanding of cancer in 'Western' medical history prior to the 'discovery' of the cell. I then outline in the briefest of terms the conditions in which cancer became understood as a disease of the cell. This section draws primarily on secondary data and is included primarily to indicate the utility of Fleck's and Kuhn's thought in understanding changing knowledge in biomedical history. It also suggests that metaphor plays an important role in ushering new knowledge. The second section also highlights the centrality of metaphor in biomedical knowledge by drawing on salient sociological and anthropological theory showing how pervasively knowledge of the body is framed through the metaphor of social organisation. The third section, the 'raw material' of this chapter, uses biomedical texts on cancer as primary data sources and identifies the metaphors they contain. It outlines how malignant cells are metaphorically understood as deviant individuals. The analysis then focuses on two contemporary approaches—immunology and molecular biology. Both are united by the motif of the deviant individual, but while immunology highlights flaws in systemic control that allows individual cells to evade control, molecular biology locates the rebellious inclinations within individual cells. In the fourth section I return to the theoretical concerns developed in chapter two, by arguing that biomedical knowledge about cancer has strong conceptual affinities with dominant modes of conceptualising both women and nature. In this section, I draw almost exclusively on secondary historical sources and sociological literature to show how biomedical knowledge has, and continues to, consistently link cancer and women. Finally, in the fifth section, I take two biomedical texts as my primary source to reveal the way biomedicine symbiotically links cancer, women and the threat to order. They also demonstrate the way biomedical knowledge is a 'religious' phenomenon that offers the hope that disorder can be disarmed and subjugated by science and medicine.

CANCER IN WESTERN MEDICAL THOUGHT PRIOR TO 'THE CELL'

The contemporary definition of 'cancer' refers to any condition arising from the uncontrolled division and multiplication of cells. For a disease so closely linked with modernity in the popular imagination, cancer has a long history as Pinell demonstrates (2000: 671).[1] Dinosaur fossils show evidence of tumour formation. (McGrew 1985: 47). Likewise, documents from ancient Egypt describe what would today be defined as breast cancer and tumours have been found in Egyptian mummies (McGrew 1985: 47-48). The term 'cancer' first appears in the medical literature of Ancient Greece. Hippocrates introduced the term 'karkinos' (the Greek term for crab), because he observed a characteristic pattern of swollen veins on the skin above

[1] I will refer only to the history of 'Western' medicine.

tumours that resembled a crab (Benedek and Kiple 1993:101). Some also argue that it is possible Hippocrates (b 460 BC) associated cancerous tumours with crabs because the pain they often evoked was likened to being caught between their pincers (McGrew 1985: 48; Porter 1997: 575). The crab metaphor was extended from the form of tumours to their 'behaviour'. In the 15th Century, Avicenna, for instance, likened tumours to the tenacity of crabs in holding onto their prey. Other terms in contemporary use also derive from the Ancient Greeks: 'neoplasm' (new growth), 'oncology' (the study of masses) and 'tumour' are all derived from them (Benedek and Kiple 1993: 102). Other aspects of cancer's history show continuity, primarily concerning the efficacy of the treatment of certain of its forms. Hippocrates, for instance, cautioned against treating deep seated, or 'occult', tumours believing that it was ineffective and likely to hasten death (Benedek and Kiple 1993:102; Porter 1997: 575). Debate about the virtue of performing mastectomies for breast cancer also surfaces periodically (Benedek and Kiple 1993:102; Porter 1997: 575). Hippocrates was decidedly gloomy about the effect of treatment, "…I have not been able to cure one woman of a single cancer in spite of frequent efforts with all my powers" (quoted in Demaitre 1998: 633).

Not surprisingly from the perspective of the sociology of knowledge, medical knowledge about cancer is entwined with wider philosophical concepts and issues in the context in which it is formulated. Far from being a disease of uncontrolled cellular division, in the Hippocratic paradigm, cancer was understood to be inflammation or swelling (Demaitre 1998: 610). It seems obvious enough to state that cancer could not be regarded as cellular pathology in the absence of a concept of the cell. However, this kind of reasoning can easily lapse into 'Whig' history, (Bullock and Stallybrass 1977: 674) in which developing knowledge of the 'cell' is taken as a marker of progress away from error and superstition toward 'True Knowledge'. Moreover to consider that cancer could not be understood as a cellular pathology merely because 'the cell' had not been discovered overlooks the way earlier medical accounts of cancer were consistent, and plausible, within their own intellectual paradigms. Those historians of medicine with rudimentary sociological awareness point out that while ancient medical theories may seem nonsense laid alongside contemporary biomedical knowledge, they make sense when seen within the intellectual parameters of their day (King 1973: Miller 1978). Rather than regarding prior knowledge systems as incomplete or incorrect, it is more accurate to regard them as paradigms, in the sense described by Kuhn (1970). In addition, these paradigms do not exist in isolation from the socio-cultural context in which they are formulated and in which 'normal science' is undertaken. The following account is not an attempt to offer a thorough history of cancer in the thought of 'Western' medicine. It merely

sketches some features of the paradigms that have constituted knowledge of cancer at any one time and seeks to broadly indicate how the social setting and cultural concerns of the context in which it was formulated indelibly influenced this knowledge.

According to dominant strands of early Greek philosophy, the earth was composed of four substances and human beings, being a microcosm of the universe, were also composed of these elements. In addition, 'four', as a concept, was central to much Greek philosophy. Hence humoral theory should not be considered apart from these philosophical underpinning (King 1973 Miller 1978). The body had four humours, corresponding to the four primary elements and their qualities:

Table 4.1: The elements of the universe and their relationship to bodily humours and bodily qualities

Elements	Qualities	Humours
Earth	Dry cold	Black bile
Air	Wet heat	Blood
Fire	Dry heat	Yellow bile
Water	Wet cold	Phlegm

The earliest written documents regarding cancer in the history of 'Western' medicine are the Hippocratic corpus. Cancer, according to Hippocrates, was due to an excess of black bile. Associations were made between cancer, diet and temperament: certain foods produced bile and black bile was associated with melancholic dispositions (Demaitre 1998: 619). The link between diet and cancer is still made and voluminous research still traces the link between temperament and the onset or progression of cancer, particularly breast cancer (see for instance, Hiller 1989). While King points out the empirical error of Hippocratic suppositions, he nevertheless concedes that they were theoretically grounded and empirically tested. Indeed, says King, "It is clear that such an attitude is thoroughly scientific in the most worthy sense" (1973: 34). Moreover, in King's opinion, Hippocratic medicine satisfied many of the contemporary canons of scientific medicine (1973: 36).

Galen (born 130 AD) inherited much of the knowledge of the Hippocratic tradition as well being swayed by Aristotelian philosophy. The tenets of Galenic medicine, though not unchallenged, remained dominant in the 'West' until the 17th Century and the advent of the 'scientific revolution'. Galen too accepted the humoral theory of the body and its ailments and wrote tomes offering sound reasoning and careful observation in support of this paradigm. However, his great legacy was systematically developing the Hippocratic paradigm rather than original thinking and hence he continued the dogma that cancer was inflammation due to over-accumulation of black bile (King 1973: 85). Due to Galen's dominance, cancer remained

conceptualized as a disease of inflammation in dominant strands of 'Western' medicine for nearly 1500 years.

Miller (1978:186) and Knight (1992: 37) point out that the technology of any given period provides a set of metaphors for understanding bodily processes. Given the technology of the time and the philosophy of humours with qualities of heat, cold, moisture and dryness, it is not surprising that Galen's view of the body approximates that of a factory, though a decidedly old fashioned one. According to Knight, Galen used available models in fashioning his account of bodily processes, drawing on notions of cooking, brewing and smelting (Knight 1992: 37-38). Miller also discerns metaphors of, "…manufacture and transformation, cooking, brewing and smelting – processes which convert, purify and refine tangible substances" (Miller 1978:187). Horticultural metaphors were also employed to describe tumour growth and spread. Galen argued that in its initial stages tumours were like small seedlings "…that came out of the earth and are recognized only by the best farmers" (Demaitre 1998: 627). The notion of small, almost imperceptible, beginnings that spurred large growth was documented. One author gave a graphic account of small tumours becoming as big as a 'melon' (Demaitre 1998: 628). As Demaitre remarks, such descriptions were, "… not fanciful embroideries but were drawn from observation and motivated by a concern with diagnostic precision" (Demaitre 1998: 628).

Modernity: The 'Discovery' of the Cell

It was not until the 'discovery' of the cell in the 17th Century that a truly modern understanding of cancer begins to become a possibility.[2] Robert Hooke first used the term 'cell' in 1663 after examining the structure of wood and finding it composed of 'pores' (Knight 1992: 52). However, he meant by the term a space surrounded by a wall, not a self-contained, living entity (King 1973: 176: Knight 1980: 52). The idea of the living cell did not appear until the 19th Century (Knight 1992: 52). In 1670, Malpighi provided a more detailed description of cells in plants, arguing that they were more than mere spaces (Knight 1992). However, understanding of cells remained extremely rudimentary for another two centuries, because of the poor quality of microscopes (Knight 1992). Had microscopes been of better quality cells could have been visualized much earlier and thus have been better understood, according to historians of medicine such as Knight (1992: 53). However, my argument is that

[2] I use quotation marks around the word 'discovery' because I do not want to suggest that there were, or are, 'cells' that have always existed and merely awaited a discoverer for their existence to be recognized and understood. However, I do not wish to consistently articulate an epistemological argument when referring to a new development in medical thought. The quotation marks indicate skepticism about positivist views of knowledge and Whig accounts of history.

such reasoning makes a positivist assumption that 'facts speak for themselves' and neglects, as Miller (1978) demonstrates, how underlying assumptions condition both the ability to see and to understand what is seen. A sociologically sensitive analysis contends that what is seen only makes sense within a prior theoretical framework and the argument that cells were not understood earlier because of the underdeveloped quality of microscopes overlooks the central role of theory in guiding perception.

While cells were first 'seen' in the 17th Century, anything approaching a contemporary perspective on the centrality of cells to biology did not develop for almost two centuries. This was because there wasn't a theory of the body in which cells make sense until that time. The still dominant humoral theory, articulated in a focus on blastema, continued to provide the theoretical framework in which new postulates and observations concerning the cell were located. From this perspective, cells arose from the generative fluid; blastema (Knight 1992: 53). As the dominance of humoral theory receded, a conceptual space emerged in which the notions of cells began to acquire their modern meaning. During the 18th Century, the emphasis in medical and biological thought increasingly moved from organs to tissues, both in the clinic and the laboratory (Knight 1992: 185). Schwann, early in the 19th Century, finally articulated what remains contemporary dogma, that cells are organisms and that 'animals' are aggregates of these organisms. It was not until the mid 19th Century that Virchow's doctrine, "every cell proceeding from a cell", finally became orthodoxy, displacing blastema theory. What was the source of Virchow's famous declaration of the 'truth'? A metaphor according to Miller:

> Taken at face value, a cell could have been visualized as a geometrical alternative to the fibre – a structural component which happened to assume a globular rather than a linear form. For scientists such as Virchow, however, the way in which cells arose and composed themselves indicated that the living organism was a republic of biological persons…Virchow arrived at this conclusion under the influence of his political beliefs, ...as a passionate liberal of the 1848 generation he was predisposed to see the organism in republican terms (Miller 1978: 267).

Virchow's understanding of the body is a fundamental rupture with humoral theory and provided a new paradigm through which the anatomy, physiology and pathophysiology of the body are still understood. This new understanding of the body and of cells had profound implications for the understanding of disease. Ehrlich, a joint winner of the Nobel Prize for

Medicine in 1908, asserted that the cell is the, "…axis around which the whole of the modern science of life revolves" (Magner 1992: 346). It provided a new paradigm for understanding cancer. Cells, not blastema or humours, were now held to be the geneses of cancer. Virchow, the great pathologist of the latter part of the 19th Century, believed everything hinged on cells: diseases came from abnormal changes in cells and abnormal cells, through cell division, multiplied.

Two theories have dominated 20th Century understanding of cancer, each based on the concept of the cell. The first, immunology, was formulated in the early part of the 20th Century, while molecular biology has assumed increasing dominance after the 'discovery' of DNA in 1953 by Watson and Crick (Bullock and Stallybrass 1977: 432). This chapter reviews the fundamental tenets of immunological and molecular biological understandings of carcinogenesis and the way they are metaphorically structured. These theories dominate contemporary biomedical thinking about cancer. While they are not opposed or mutually exclusive, they each emphasize different factors in explaining the development of cancer. Molecular biology, currently in the ascendant, focuses on genetic material within cells, while immunology takes the working of the immune system as the primary factor explaining cancer.

However, prior to sketching these theories, it is illuminating to consider the wider metaphorical understanding of the body upon which both of these theories rest. Mary Douglas (1978) suggests that the social order always shapes the understanding of the body, its structure and function. Given that disease cannot be understood apart from prevailing models of the body, it follows that the social order, through shaping the perception of the body, will inevitably shape the understanding of disease.

THE BODY AS METAPHOR

Anthropology has made the symbolic, that is metaphoric, attributes of bodies much more central to its analytical repository than sociology (Turner 1991: 5). Indeed, until recently, the body was not overtly theorized in sociology, being, as Shilling phrases it, an "absent presence" (Shilling 1994: 9). Given the lack of interest in symbolism within sociology generally, it is not surprising that bodily symbolism has received little attention. Theoretical interest in the body was not much evident in sociology until the 1980s, spurred particularly by the publication of Turner's *The Body and Society (1984)* and O'Niell's *The Five Bodies (1985).*

Bryan Turner comments, "…the body is the central metaphor of political and social order…." (1991: 5). Mary Douglas's *Natural Symbols* (1978) retains a pivotal place in demonstrating the ubiquity and power of understanding the body through social images. The way in which we think about our bodies rests on a paradoxical sequence of reasoning, as Douglas points out. Bodies are natural in that they are not merely artefacts of culture, yet we cannot think of them except through cultural values and symbols (Douglas 1978: 11). Following an explicitly Durkheimian precept, the book explores the, "…correlations between the character of the symbolic system and that of the social system" (Douglas 1978: 12). Any understanding of the body reflects the symbolic classification system of the social context in which it occurs, including what is recognized as threatening and polluting, as well as orderly and beneficent (Douglas 1978: 11-18). These insights are useful in understanding the metaphors permeating biomedical knowledge about cancer and coronary heart disease.

Both immunological and molecular biological understandings of carcinogenesis rely on a common model of the body, conceptualizing it as a functional hierarchy involving dynamic equilibrium between parts and whole. The society–body analogy is clearly active in biomedical statements about the functioning of 'normal' bodies and the malfunctioning of those afflicted by disease. The following definition of body structure and function is synthesized from two anatomy and physiology texts:

Table 4.2: The hierarchy of the body's structure and functions

Structure	Function
Cells	The basic structural and functional entity of the body. They are discrete entities in themselves with their own needs and duties. Formed from common material and processes, they are specialized for different functions in different bodily sectors.
Tissue	A higher level of organization made up of similar kinds of cells, creating a structure performing certain functions independent of those of its constituent cells.
Organs	Composed of different kinds of tissues to form an even higher level of organization with more specialized functions and with limited autonomy from its constituent structures.
Systems	The highest level in the body's hierarchy, it is an association of organs, grouped together to perform complex functons that could not be performed by organs alone.

(synthesized from Tortora and Anagnostakos 1981:4; Miller and Keane 1978: 187;725;976-977 and 1005)

These elements together form the organism (body) that is a complete, purposeful system of dynamic equilibrium. Modern, 'Western' society within (broadly defined) liberal democratic

parameters is also a system of dynamic equilibrium between parts and whole. Like cells, individuals are the constituent elements of society but participate in structures and functions that have an existence and meaning independent of them. Social life depends not only on their functional integrity but also on their correct articulation. Consider my parody of Table 4.2:

Table 4.3: The hierarchy of society's structure and function

Structure	Function
Individuals	The basic structural and functional entity of society. They are discrete entities in themselves with their own needs and duties. Formed from common 'material' and processes, they are specialized for different functions in different social sectors.
Families	This is a higher level of organization made up of similar kinds of individuals, creating a structure performing certain functions independent of those of its constituent individuals.
Social groups	Composed of different kinds of family members to form an even higher level with more specialized function and limited autonomy from its constituent structures.
Systems	The highest level in the structural hierarchy of society: it is an association of social groups that together perform complex functions that could not be fulfilled by social groups alone.

Following Douglas' argument that social organisation shapes understanding of the physical body, it is clear that they both contain the following features:

- A functional hierarchy with an elaborate division of roles characterized by a dynamic equilibrium between parts and whole. Cells, very much like individuals, have their own identity and function, yet are building blocks in overall system. Just as individual produces and consumers are essential parts of the economy, without being able to 'know' or decide its purposeful activity, cells are essential to the body, but cannot comprehend, or direct, its function. This conceptualization admits a distinction between constituent parts and systemic function.
- The order of both systems is dependent on a gradation of structures of increasing functional complexity, of increasing role specialization, of increasing autonomy and, therefore, of increasing distance from the activities and intentions of constituent parts.
- The basis of this functional hierarchy is the division of labour. Cells are specialized for particular functions, in the same way individuals are, and this involves strict role performance and spatial confinement.

Both bodily and social order then depend on:

- Balance of internal supply and demand of roles; that is a division of labour in this highly differentiated system. Thus, we need cells and individuals of particular kinds, in relatively precise proportions.
- Cells and individuals stay in their allocated roles. Kidney cells, for example, must not perform the functions of liver cells. Nor, as the sick role acknowledges (Parsons 1951), must individuals abandon their functional roles.
- Spatial circumscription is an important aspect of this division of labour: both cells and citizens must stay in the location congruent with their role.

CANCER AS DEVIANT CELLS

All contemporary biomedical theories of cancer implicate the basic functional unit of the body—the cell—and stress its deviance in opposing the 'normal' laws of bodily function. The theme of cellular deviance was evident in all the texts I analysed (see appendix one) and found expression in both immunological and molecular biological theories of cancer. The degree to which cancer is presumed to have its origins in 'cellular' deviance is evident in McCarthy's assertion that malignant tumours start from a single cell that "goes wrong" (1984:8). The end result of this deviation is uncontrolled growth, leading to tumour formation. Thus, for McCarthy, and all the other authors I scrutinized, the individual unit of the overall system is the locus of what eventually becomes systemic disorder. Cancer, according to McCarthy (1984:8), is the loss of regulation of the orderly dimensions of cells' behavior. According to McCarthy, malignant cells exhibit three characteristics. Firstly, the body needs only specific numbers of particular cell types; cancerous cells reproduce beyond the proportions required for systemic function. Secondly, they gradually, and to varying extents, abandon the function of normal cells. Finally, they quite literally move out of their allotted space, 'invading', or 'colonizing' other areas of the body (McCarthy 1984:9).

Within biomedical texts analysed for this thesis, the activity of malignant cells is described as the assertion of autonomy, of unfettered self- expression, of rebellion against the restraint and discipline demanded of them by the wider order. Richards, in a somewhat histrionic passage, casts cancer as passion juxtaposed to reason: malignant cells are 'lusty' and 'selfishly' reject restraint in favour of self-gratification:

> Cancer cells are very much alive. They have a lust for life and for their own reproduction, but they are a form of life that is totally selfish, unconcerned with the well being of the organism within which they

> dwell. They divide and reproduce themselves without orderly or specific purpose, invading neighbouring tissues and organs…They show a total contempt for the right of other cells to accomplish their task without interference: if they are not stopped in their destructive course their uncontrolled proliferation will result in the death of the carrier organism (Richards 1972: 3-4).

Lucien Israel, using the metaphor of the factory, also imputes a sense of willful and destructive rebellion to malignant cells. The factory metaphor is important, I contend, because it underscores the link between bodily order and the division of labour. Furthermore, the metaphor of the factory implicitly equates bodily order with instrumental activity and productivity. However, what remains overt in Israel's account and central to his understanding of cancer is cells rebelling against order:

> To go back to the metaphor of the factory, the different units of production (ie the malignant cells) have now joined together. They proliferate, send toxic products to the outside, encroach upon the territory of the units that have remained normal, infiltrate them, compress and destroy them, feed off their substance. The group of crazy units is armed for attack, while the normal units have no means of defence (Israel 1979: 18).

The ubiquity with which the biomedical language describes malignant cells as deviant and highlighting the potential anarchy of unfettered cellular self-expression is evident in the following tables (4.4 and 4.5). While biomedical knowledge does not describe it in such terms, given the society-body homology, cancer can be considered the Hobbsian nightmare of the war of all against all. A review of some book titles published during the past four decades reveals the centrality of the deviance motif in biomedical literature:

Table 4.4: The deviance motif in titles of books about cancer in the past four decades

Author	Date	Title
McGrady	1964	The savage cell: a report on cancer and cancer research
Richards	1972	Cancer: the wayward cell
Prescott	1973	Cancer: the misguided cell
Maugh	1975	Seeds of destruction: the science report on cancer research
LaFord	1988	Cancer: the outlaw cell
Weinberg	1998	The renegade cell

Moralistic ascriptions of deviance to malignant cells are not confined to eye catching book tiles they are ubiquitous in biomedical discussion of cancer.

Table 4.5: Terms used to describe malignant cells

Author	Term
Richards (1972)	Selfish Purposeless Contemptuous Destructive Uncontrolled
Israel (1979)	Crazy
Currie (1974)	Anti social Delinquent Rampaging
Forbes (1990)	Immature Irresponsible Parasitic

What is striking about these attributions of malignancy is the conflation of moral and bodily order. The terms used to describe cancerous cells are also those employed about individuals judged deviant: 'delinquent', 'anti-social', 'irresponsible', 'parasitic' and the like. This language reveals concern about the fragility of both bodily and social order and their mutual dependence on proper motivation and constraint of their constituents. It is interesting to note that even Freud had something to say about cancer cells, as Hiller notes (1989). They are, according to Hiller, deemed "narcissistic" by Freud. As Hiller observes in reviewing some of the attributes associated with cancer, normal cells, with 'correct' sexual instincts, take other cells as their objects, obviating their own death wish (Hiller 1989). Thus, I suggest, that cancer can be conceptualized within a Hobbsian framework that locates cancerous cells in the 'state of nature'. The pursuit of individual goals and desires, over and against the demands of order, undermines systemic function:

IMMUNOLOGY: FLAWED SYSTEMIC CONTROL

Immunology gained identity as a discipline in the latter part of the 19th Century and the early part of the twentieth, though interest in immunology has existed throughout the history of 'Western' medicine (Dwyer 1993: 70-73). As early as 1908, Ehrlich asserted that one of the functions of the immune system was prevention of tumour formation (Becker 1975:121; Allison 1977: 151-155). Arguing that 'aberrant' (malignant) cells were "unusually common" in foetal and post foetal development, most people remained unaffected by them. The immune system kept these aberrations 'latent': without this immunological activity, cancer might be expected to have "enormous frequency" (Allison 1977: 151). From an immunological

perspective, cells are the nidus of dysfunction, but exist within a larger dynamic of equilibrium and control. Lewis Thomas, one of the most erudite of a 'new' generation of biologists, extended this claim about the complex and problematic relationship between cells and order. While order demands uniformity, cells display anarchic tendencies throughout our entire lifespan. It was in this tension, between collective requirements for order and the incipient rebellion of cells, that the problem of cancer might best be understood (Thomas 1974).

In a 1967 text, Green called for a reorientation of conceptual approaches to cancer. Specifically, he wanted to shift attention from the attention toward the much-vaunted autonomy of the malignant cell, to a perspective that did:

> Not treat the cancer cell as an entity on its own, but …account(ed) for its lack of 'social' behaviour and its relative lack of response to control mechanisms (1967: 1-2).

In considering cancer, Green takes bodily order as his starting position; his reasoning is, in effect, that we can only understand cancer within a broader teleology of the body. Order, function, and purpose lie with the greater entity (the body) not with its constituent parts (cells). For Green, happenings within cells are not decisive, what is crucial is their lack of response to control mechanisms. The immune system is, like Durkheim's concept of society, *sui generis* and order can never be explained by the characteristics, or action, of cells themselves.

McFarlane Burnett took up this theme in a later series of lectures in which he located the problem of order as central to immunology (1976: 45). Order, in his view, is the body's natural state and, though we take it for granted, is only maintained by a system of continuously operating controls (Burnett 1976: 47-50). The immune system is a control system concerned with anything 'foreign', that is, not genetically 'proper', to the individual. Order is dependent on distinguishing self and non-self and this derives from a *sui generis* level of organization, not constituent bodily parts acting autonomously. Though the body is differentiated and stratified (by cell, tissue and organ), the idea of self constitutes the body as a homogenous and unified system, acting as a cohesive whole.

However, Burnett was reiterating what had been a central theme of immunology since it was first formulated as a discipline of medical thought and practice in the late nineteenth and early twentieth centuries. It was reasoning of this kind that led him to formulate the concept of

‘immunological surveillance’ and it has become part of medical orthodoxy (Burnett 1976: 115; Spaner; Radvanyi and Miller 1998: 241). Its basic tenet it that cancerous cells are often, if not routinely, present in the body, but are identified as ‘non self’ and destroyed by the immune system.

Burnett is overt about the homology of body and society and explicitly casts the immune system in this role:

> …the system must always be on the alert to combat foreign intrusions as well as ‘disloyalty’ within…one of the chief functions of the system is to maintain a series of checks and counterchecks against its own agents. The system is necessarily complex, first because of the difficulty of distinguishing self from non self, of knowing who is in his proper place and who if unchecked will endanger the safety of the organism (Burnett 1976: 50).

From the standpoint of immunology, tumour formation represents a paradox. If a system exists to recognize and destroy malignant cells, how then do they survive and form tumours? The extent to which cancer is seen as evidence of systemic of failure, having its origin in individual deviance, is seen in the explanation of this paradox. Malignant cells use ‘escape mechanisms’; a collective term for about five different mechanisms cells use to avoid immune surveillance (Richards 1972).

The term ‘escape mechanisms’ is significant, I suggest. Firstly it centres the ‘blame’ squarely on individuals ‘citizens’ that insist on following their own interests and spurn systematically ordained prescriptions for behaviour. This emphasis is strange given the decisive role accorded the immune system. Immunologists would side with Durkheim that a certain amount of ‘deviance’ is inevitable, if not functional, because it strengthens the boundaries of self and non-self. This suggests that the immune system, like the state, must continuously survey its environment, scrutinizing it for signs of deviance. The notion of ‘escape mechanisms’ strengthens the association between moral and material order. ‘Escape’ connotes deviousness and illegitimacy: implying rebellious motives and furtive means against legitimate order. It also suggests that order, once lost, cannot be regained. It is not just the formal mechanisms of order that dissolve, but the very notion and possibility of orderly, peaceful existence. Immunology has some broadly defined parallels with a Hobbsian view of social order. Human beings in a ‘state of nature’, that is unrestrained by the external authority of society and unbounded by notions of the common good, ineluctably follow their own interests and create

conflict. Hobbes even has a spatial conceptualization of the basis and denouement of this conflict (Turner 1984: 89). The solution lay in individuals surrendering their rights to an external influence that could restrain and order them, thus creating the body politic. Hobbes defines this as "A multitude of men (sic) united as one person, by a common power for their common peace, defense and benefit" (quoted in Turner 1984: 88*).* Hobbes declaration can easily be restated as a definition of the functioning of the immune system "A multitude of cells united as one body, by a common power for their common peace, defense and benefit".

MOLECULAR BIOLOGY: FLAWED INDIVIDUALS

Whereas immunology locates the activity of cells within a systemic immune system, molecular biology focuses on the cell, and more particularly telescopes its vision to the internal workings of the cell to explain carcinogenesis. Molecular biology is a development within biophysics that explains all biological structures in reference to molecular structures (Bullock and Stallybrass 1977: 37). Historically, its vision has narrowed from attention on the cell *per se* to chromosomes; its vision then narrowed even further to genes and then refined it to focus on DNA. Contemporary research has circumscribed its interest even more narrowly, taking the chemical constituents of DNA as the site of investigation.

Biomedical writing on molecular biology compares the structure of cells to the components of language, as the following table reveals:

Table 4.6: Genetic structure of cells

Genetic Structures	Capacity for Language
Chemical constituent of DNA (four chemicals symbolized by the letters A, C, G, T)	Alphabet
DNA	Words
Genes	Sentences
Chromosomes	Chapters

(synthesized from Richards 1972: 49-53 and Forbes 1990: 143-153

The cell is a hierarchy of increasingly complex structures. The constituent elements of DNA are metaphorically identified as the most rudimentary element of language. As the structure of cells becomes more complex, cells are metaphorically understood to acquire the potential for elaborate, purposeful and complex speech. This progression depends on proper information flow from 'primitive' to complex structures (Forbes 1990: 143-153). Genetic information is coded in DNA that is located in genes and which combine to form chromosomes. Genes "tell cells what to do." Says McCarthy, "A cell is where it is and doing what it is doing…because of DNA" (1984:11). It is important to note that the DNA in all cells is identical and all cells

have exactly the same genes. However, in the interests of bodily order, cells must specialize to take up particular function as part of tissues and organs. For a cell to develop into, say, a muscle cell, some genes must be expressed and some must be repressed. This process is called 'differentiation' and is regulated by DNA coded in genes. Cell development and identity (the kind of cell they become) is determined by the 'controlled' expression of genes (McCarthy 1984: 12).

However, there is a hierarchy of differentiation: some cells are more specialized than others. There are 'primitive' cells and these are 'multipotent': that is, they have the potential to differentiate into any kind of cell (Hancock and Bradshaw 1981:14). This potential anarchy is thwarted by the action of DNA, which represses uncontrolled genetic expression (Hancock and Bradshaw 1981:14).

Like immunology, molecular biological explanations of cancer implicate the cell as the focal point of cancer's development. However, this perspective makes events within cells the decisive causal locus. From this perspective, cancer is deemed a disease of 'de–repression'; that is a loss of internal control in cells leads to systemic dysfunction (Hancock and Bradshaw 1981: 14; McCarthy 1984:11). This theory defines the structure of cells as sequentially layered information systems, as layers of potential, outlined in the previous table 4.6. Malignant cells are those in which "de-repression" of DNA occurs. De-repression is responsible for the alleged autonomy of cancerous cells, making them so harmful to bodily order. Says Currie:

> …cancer is frequently regarded as the inexorable outcome of a totally autonomous and delinquent tissue mass. This autonomy of human cells has been the keystone of theoretical understanding and clinical practice for many years (1974: 1).

"De-repressed" cells are deemed "primitive" and "immature" because they have reverted to a pre-differentiated state in which selective repression and expression does not occur (Richards 1972; Hancock and Bradshaw1981).

Order thus depends not only on differentiation, but also segregation through the phenomenon of 'contact inhibition'. However, as Currie makes clear, only 'normal' cells can apprehend the cues facilitating contact inhibition:

> Tumour cells show very abnormal social behaviour in tissue culture. Some of the particular patterns of delinquency shown by tumour cells

> are lack of stable adhesion, lack of contact inhibition…Once a tumour is on the rampage in a normal tissue it is no longer subject to the restraint which operates to inhibit non malignant cells (Currie 1974: 45).

Malignant cells do not know their place and cannot 'read' signs designating where they should be and how they should behave; they are insufficiently inhibited. In Hancock's and Bradshaw's assessment:

> Normal cells also seem to know their place in the organism in that they acknowledge positional signals. Cells from different tissues show the phenomenon of contact inhibition: they recognize and mix readily with cells of the same type but when confronted with cells of different types show antagonistic effects…This inability to recognize positional signals and the failure of contact inhibition in the tumour cells enables the cells to infiltrate normal tissues and disseminate via blood and lymphatics to distant sites where they can survive in what should be alien territory (1981: 14).

Richards, in his text, describes malignant cells in ways that highlight their anti-social qualities, including their deviant 'motivation' and actions:

> A cancer is a crab as its name indicates. It claws at us, it hides in the sands of our flesh: like a crab it ignores straight walking, progresses sideways both in its refusal to behave in an honest, purposeful manner, and it its need to invade neighbouring tissues …This loss of ability to control its relation to its neighbour…manifests itself in the capacity… to disseminate. Normal cells stick to one another and have a 'home' of their own. Cancer cells may be said to belong nowhere, to have no proper residence, no home (Richards 1972: 67 and 69).

The following passage sounds remarkably similar in language and sentiment to that of Richard's, but in fact refers to a 'drug addict':

> Most individuals addicted to drugs… are interested only in satisfaction of their own primitive needs. This is a very infant form of behaviour, it is acceptable in infancy but not in adults. These individuals have not matured in a healthy way and so do not accept mature roles. They make poor husbands and wives, fathers and

> mothers, they are poor sexual partners because their social development has been retarded. They experiment with many types of sexuality but usually they cannot accept a mature heterosexual role. They are not interested in giving to anyone; they are interested only in receiving (quoted in Young 1987: 417-418).

Hence, while immunology emphasizes cancerous cells as deviant because they are, genetically speaking, 'non-self', molecular biology construes them as willfully rebellious. A central implication of the 'deviant individual' metaphor is that order is an outcome of appropriate patterns of sociability, but that this sociability is an outcome of what happens within individual cells. Order is therefore not the consequence of external or coercive authority but the 'normality' of constituent parts. This depends on cells being appropriately repressed so they can exhibit mature and responsible behaviour. De-repressed cells do not know their place and cannot even recognize the signals defining their identities and roles.

Ordered bodily function demands a finely tuned division of labour. Cells must therefore specialize for particular roles, and thus locations, to take up their place as parts of tissues, organs and systems. Specialization is known as 'differentiation' and this is the outcome of some genes being expressed while others are repressed. Cancer is an outcome of 'de-repression': the genes that should be repressed are not, leading to unregulated expression, thereby escaping ordained pathways of differentiation and thus location in the body (Hancock and Bradshaw 1981: 14; McCarthy 1984:11). 'De-repressed' cells do not show the self-restraint of 'normal' cells: they lack proper inhibition, refuse to stay in their place and thus do not make functional contribution the body. McCarthy refers to their "cancerous behavior" (1984:17).

The affinity between molecular biology's account of the malignant cell and psycho dynamic theories of individuals and social order is apparent in molecular biology's account of how malignant cells evade regulation. 'Agglutination' and 'contact inhibition' are core concepts. 'Agglutination' refers to cells only grouping with cells of like kind, while contact inhibition is the phenomena allowing recognition of similarity and difference. When cells come into contact with cells that are different, inhibition comes into play. Cells stay only with their own kind and we would not expect to find a cell specialized for cardiac function, for example, in any place other than the heart.

Clearly, the well being of the overall entity of the body requires particular kinds of cells in relatively precise proportions. Over or under production of certain cell types would disrupt systemic order. That is, those qualities not needed by, or potentially harmful to, the overall order are repressed, while desired attributes are 'called forth.' By abandoning repression in favour of unfettered self expression, malignant cells not only fail to make a contribution to the body's complex division of labour, they also abandon other aspects of cellular discipline necessary to bodily order. Very much like properly socialized human beings, 'mature' cells are those that have differentiated (specialized) to take up particular functions congruent with the proper working of the larger system; they do not exercise inappropriate autonomy. The term 'potent' is significant; imputing power, strength and vitality to what are ubiquitous and (usually) short lived and easily replaced bodily parts. The imputation of potency to these cells is also noteworthy because it implies purpose, whereas cells are supposed to be bearers, not initiators, of bodily purposes. Further, deeming cells 'primitive' is noteworthy in light of the metaphor of development and socialization inherent in these theories. Just as liberal humanism rests on a premise of an essential and universal human essence—'human nature'—cells share important qualities: they are made of the same material, through a common process and they have a common structure. Richards (1972) makes much of the very fine difference between malignant and non-malignant cells: the differences are only of degree, not of fundamental material or structure.

What is salient in this account of the cell is the metaphor of individual psychology: cells are 'de-repressed'; they lack contact 'inhibition' and cannot recognize positional signals. If immunology casts cancer cells as 'rebels', molecular biological accounts define them as 'deviant'. Another central implication is that order depends on sociability that is an outcome of proper socialization. What is noteworthy in this blue print is that order depends not on coercive authority, but on the normality of its constituent parts; that is on cells being 'normal', 'mature' and differentiated. "Primitive', 'immature' cells, those who have been 'de-repressed' do not, repeating that feudal phrase, 'know their place'. They cannot even recognize the signals defining where they should be and what they should be doing. Having failed to exercise 'selective repression', necessary for cells to take up their appointed position within the order, they fail to 'mix easily' and create antagonism. This too could easily be read as a narrative about under socialization and subsequent deviance.

WOMEN: FLAWED BODIES, FLAWED SUBJECTIVITIES AND THE RISK OF CANCER

Cancer has not been regarded as a universal, genderless threat. Women have always been considered at greater risk of cancer than have men. The 'Ancients' believed that cancer was a particular threat for women; breasts, uteruses and other 'internal organs' were regarded as particularly common and vulnerable sites for cancer (Patterson 1987:13). While women have always figured prominently in medical thought, even generating the specialty of gynecology, medical knowledge about cancer generates significant metaphorical associations with women. Firstly, women's sexual and reproductive organs are imbued with impulses and instincts that, if thwarted, exact a truly malignant revenge: they become cancerous. Secondly, the emotional attributes of women emotional makes them more susceptible to the development of cancer. I will discuss each of these issues in turn.

Medicine has traditionally regarded women as less rational than men because they are at the mercy of irrational bodily impulses they cannot adequately control (Turner 1984: 115-136). The term 'hysteria' is derived from the Greek word for uterus and has, historically, been connected with under-employment of the womb (Turner 1984: 102). While it might be comforting to regard this as a relic of antiquated sensibilities, the tradition of connecting women's social and emotional well being to the 'dictates' of their bodies remains alive and well. The International Health Foundation proclaimed in 1975 that under-employment of the womb remains a threat to women's well being:

> …for many women the menopause is a period of disorientation, physical problems and psychological imbalance (quoted in Greer 1990: 19).

Premenstrual dysphoric disorder, a kind of pathological update on premenstrual tension, was added to DSM 1V in 1993 (Vines 1993: 12-13). While it was added as a "… proposed diagnostic category needing further study" (Vines 1993:12), even its provisional inclusion indicates that the link between women's 'unruly' bodies and their flawed subjectivities continues to exercise considerable sway within biomedical knowledge.

Clearly women's behaviour is still regarded as driven by, to some extent and at some times, biological imperatives. According to 19th Century biomedical thought, the uterus was "…an animal, eager for young and turning spiteful if frustrated" (quoted Davis and George 1988: 147). This is not the description of an organ that functions mechanically: 'building', 'levering' or 'filtering, the way androgynous organs—like muscles or kidneys—do. The

uterus, apparently, has a will of its own, or, in sociological parlance, it exercises agency. It can thwart, even harm, the overall function of the body by exercising its own prerogatives: in much the same way as cancer cells can. However, once again this vision of the uterus becoming 'spiteful' through frustration is not mere Victorian nostrum. The following quote is from the 1980s and contains remarkably similar sentiments about the aetiology of breast cancer:

> It begins to look more and more as if the longer you keep the breast frustrated from its ultimate transformation into a secreting organ that is producing milk, the worse it is for the breast (McCarthy 1984: 15).

Compare the theme of the 'frustrated breast' with accounts of the aetiology of testicular cancer, the most commonly occurring cancer in men aged seventeen to thirty five years, "A person (sic) with an undescended testis has an increased risk of testicular cancer" (Forbes 1990: 204). Note that persons, not the gendered entity of 'men', get testicular cancer, but only as a result of the mechanical failure of the testis to descend. Testes do not have the autonomous, irrational wills attributed to breasts and uteruses. Testicular cancer is not the outcome of testicles being 'frustrated' or turning 'spiteful'. There is no suggestion that it expresses frustration at not fathering children. One study did find an association between the risk of testicular cancer and 'sub-fertility'; that is having fewer children than the national average for men their age. However, the most likely cause is *inutero* exposure to hormones disrupting growth (Moller and Shkkebaek 1999). It is not 'frustrated testicles' acting with a will of their own. Forbes (1990: 174) notes that the factor typically associated with testicular cancer, other than undescended testis, is smoking. Having had a vasectomy and early age at first intercourse are suggested 'minor' risk factors, but they have not been proven (Forbes 1990: 174). I find no suggestion in the biomedical literature that cancer of the prostate, believed to have its genesis in the mid to late forties age span, is connected with diminished vitality and potency or a mid life crisis.

Cancer affecting women's sexual and reproductive organs remain so distinctive, so noteworthy, that numerous books have been written about them. Breast cancer remains a topic of particular focus, as the following table attests:

Table 4.7: Breast cancer titles

Author	Date	Title
De Moulin, Daniel	1989	Short history of breast cancer
Clarke, Valerie; Lavery, Judy and Ruffin, Coral	1993	A journey through breast cancer: reflections of thirty survivors
Wadler, Joyce	1994	My breast: one woman's cancer story
Batt, Sharon	1996	Patient no more: the politics of breast cancer
Lerner	2001	Breast cancer wars: hope, fear and the pursuit of care in 20th century America
Leopold, Ellen	2000	A darker ribbon: breast cancer, women and their doctors in the 20th century
Accad, Evelyne	2000	Wounded breast: intimate journeys through cancer
Potts, Laura (ed)	2000	Ideologies of breast cancer: feminist perspectives
Olson, James	2002	Bathsheba's breast: women, cancer and history

In North America, the 'National Breast Cancer Coalition' was formed in 1991 with the intention of 'eradicating breast cancer' (Langer 1992: 207-209). Australia has a National Breast Cancer Centre, managed by the New South Wales Cancer Council, given $15 million in funding for the first three years of its operation (Redman and Kearsley 1995: 432). While attempts to prevent breast cancer or encourage its early detection are welcome, it is almost inconceivable that an Australian National Testicular Cancer Centre, or National Testicular Cancer Coalition, would exist. The Australian Cancer Council sponsors an annual appeal to specifically raise funds for research into breast cancer. Cancer of the testicle is disease that generates little public awareness and public mobilization despite having a relatively high prevalence and being relatively easy to detect and having high rates of cure. There is one Australian organization devoted to cancer of the prostate, the 'Prostate Cancer Foundation of Australia'. However, it does not have sponsorship by any of the state Anti Cancer Councils.

Moreover, historically there has been an inordinate degree of focus on breast cancer, linking it with women's flawed subjectivity. Jasen (2002) reviewed the history of the notion of 'risk' in relation to breast cancer, noting that, "The concept of cancer risk…was historically seldom separated from ideas about women's essential nature"(2002: 20). In 1753, Norford, an English surgeon produced a tome on cancer, documenting case histories of people with cancer; two thirds of them were about women with breast cancer. Interrupted lactation,

cessation of menstruation, menopause, exposure to cold, emotional upset or damage to the breast by a blow were all associated with the onset of breast cancer (Jasen 2002: 21-22).

While it is true that the knowledge about the causes of cancer fluctuated according to 'wider' medical theories of anatomy, physiology and disease aetiology, a focus on breast and, to a lesser extent, cervical cancer remains a constant theme in 'Western' medical history (Jasen 2002). Herbert Snow declared that women were, "by far the more neurotic and emotional of the two sexes" (quoted in Jasen 2002: 34). Well into the 20th Century, a Canadian surgical academic recognized the significance of the breast in medical history, "Of all the organs the breast most aptly merits the sobriquet of 'the living museum specimen jar'" (quoted Jasen 2002: 35).

However, it is not just that breasts and uteruses are intrinsically willful bodily parts that gives women a greater risk of cancer. Historically, women were linked to a higher risk of cancer because of their volatile emotions and fragile psyches. Metaphorically, cancer has been and continues to be construed as a disease of flawed subjectivity. Galen linked cancer and melancholy (black bile) (Patterson 1987: 14). Later figures in the history of medicine have continued the theme. Eminent physician, Sir Ashley Cooper, linked breast cancer with grief or anxiety, while rectal cancer was the outcome of mental distress (Patterson 1987: 24). In 1885, Willard Parker a North American medic emphasized the role of "mental care, affliction or sorrow" to the onset of breast cancer. Likewise Snow argued that breast or uterine cancer was more common in women who had lost a close relative (Patterson 1987: 24).

Refusal to suckle also posed a risk of breast cancer with '… the order and designs of nature being perverted' (quoted in Jasen 2002: 27). Nuns were regarded as particularly prone to breast cancer. In 1700, Ramazzini proclaimed that, "You seldom find a convent that does not harbor this accursed pest, cancer, within its walls" (quoted in Patterson 1987: 13). There was disagreement about the role of pregnancy and childbirth in relation to the onset of cancer among women. Some medical opinion held that childless women were at greater risk, while other opinion held that the risk increased with the number of pregnancies, according to Jasen (2002: 32). Breast cancer was believed to develop among those women who had little if any sexual activity, "… the organs assumes morbid activity to compensate for the deprivation of normal function…." (Jasen 2002: 32). However, it was menopause that remained an especially risky phase for women; indeed it generated the gloomy phrase " the cancerous period" (quoted in Jasen 2002: 33). Wilhelm Reich propagated psychological theories of carcinogenesis but believed that the sexual inhibition 'known' to be much greater in women

explained their prevalence of breast and genital cancer. Reich's work was marginal to 'mainstream' medicine, but in mid 20th Century the link between emotions and cancer attracted more of mainstream medicine's attention (Jasen 2002; Hiller 1989).

In the 19th and 20th centuries, the long held association of depressed women and breast cancer, mutated into a theory that emotional repression led to breast cancer. The investigation of psycho-social causes of breast cancer become an accepted part of the research agenda into breast cancer, as Hiller's review demonstrated (1989). W H Auden translated such sentiments into poetry. His poem, Miss Gee, concludes with a doctor telling his wife over dinner:

> …Cancer's a funny thing
>
> Nobody knows what the cause is
> Though they pretend they do:
> It's like some hidden assassin
> Waiting to strike at you….
>
> Childless women get it,
> And men when they retire:
> It's as if there had to be some outlet
> For their foiled creative fire
>
> (quoted in Hiller 1989: 8)

The refrain since Galen may have had its variations, as Hiller points out—from repressed emotion, thwarted sexuality, ambivalence over femininity—but the basic message has remained unchanged (Hiller 1989). Women's flawed subjectivities and their risky bodies are intimately linked. In particular, women's bodies are not mechanical, operating from rational laws such as anatomy, physiology and biochemistry. The bodies of women are subject to irrational forces, making them mysterious and unpredictable. As such, women continue to be imbued with less rationality and, therefore, less capacity for agency in the public sphere. Nor has the theme altered over time. In 1991, The *British Medical Journal* announced that:

> Certain personality traits, such as a tendency to suppress emotion, especially anger, and to respond to stress by using a repressive coping style, have been found to be commoner in patients with cancer (Lovestone and Fahy 1991: 1219).

The ostensibly gender-neutral referents (‘patients’, ‘personality traits’) of the article are, however, belied by its tile; “Psychological factors in breast cancer” (Lovestone and Fahy 1991: 1219). The themes of the previous two millennia are re-expressed in the third. An article published even more recently in the *British Medical Journal* begins with the usual non-gender specific statement:

> The belief that the onset of cancer may be associated with a stressful life experience is found in the British, French and United States medical literature as least as far back as 1701 (Protheroe and Turvey 1999: 1027).

The article relates a case-control study undertaken to test the hypothesis that stress is linked to the onset of cancer. The study could have focused on a cancer specific to men, or it could have chosen a non-gender specific cancer to test the influence of the beguilingly gender-neutral concept of ‘stressful life experience’. However, the subjects for the research were women with suspected breast cancer. The linking of psychological states with women, and in particular with breast cancer, continues an ancient theme of linking women and cancer. While the intensive interest in the role of psychological factors for breast cancer has abated a little since the 1960s, the tendency to link women’s bodies with their psyches has not.

The nexus between women’s biology and their psyches continues to be made in relation to cancer. I did a search of the ‘Academic Search Elite’ database using the following search terms: ‘stress and breast cancer’, ‘stress and prostate cancer’, as well as ‘stress and testicular cancer’. The search was limited to peer reviewed publications. The quantitative results are themselves illuminating. The search on stress and breast cancer yielded 69 records. In the case of ‘stress and prostate’ cancer, 18 records were retrieved. The search for ‘stress and testicular cancer’ did not yield a single record. Of those articles on ‘stress and prostate cancer’, overwhelmingly they were narrowly biomedical in orientation. A few article titles convey the flavour of the research and the reporting of results (I picked the first, middle and last title in the search results):

- ‘Pathological and molecular aspects of prostate cancer’ (DeMarzo et al 2003).
- ‘Keatinocyte growth factor activates p38 MAPK to induce stress fibre formation in human prostate DU145 cells (Mehta et al 2001).
- ‘Prooxidant-antioxidant shift induced by androgen treatment of human prostate carcinoma cells (Ripple and Henry 1997).

Only two of the eighteen titles came close to a psycho-social understanding of stress. However, the link was not between stress and the development of cancer, but only in relation to stress as a response to the debilitating side effects of treatment—an entirely rational response. Clearly, there is nothing irrational about men that link them with cancer. I cite the titles of the two articles below:

- 'Distress due to unwanted side-effects of prostate cancer treatment is related to impaired well being (quality of life)' (Helgason et al 1998), and
- 'Are we promoting stress and anxiety'? (Whelan 1997).

The search on 'stress and breast cancer' like that for prostate cancer included titles that were narrowly focussed on biomedical factors, for example:

- 'Serum adrenal androgens in women with primary operable breast cancer' (Aspinall et al 2002), and
- 'Demonstration of mixed properties of RU486 in progesterone receptor (PR)-transfected MDA-MB-231 cells: a model for studying the functions of progesterone analogues'(Lin et al 2001).

However, unlike the prostate cancer search, the search on breast cancer included title that clearly linked psychological factors with the onset or recurrence of the disease:

- 'Stressful life experiences and risk of relapse of breast cancer: observational cohort study' (Graham et al 2002) and
- 'Stressful life events and difficulties and onset of breast cancer: case-control study (Protheroe and Turvey 1999).

The results of my scan of one database are corroborated by other findings. Hanson (2001) conducted search of the titles related to cancer and gender since 1966 catalogued through Medline, the world's largest medical database. She found that cancer affecting women's sexual and reproductive organs received far more frequent attention than did cancer affecting men's sexual and reproductive organs, with breast cancer receiving the greatest single attention (2001: 469).

Given the inordinate focus on women's risk of cancer, it is hardly surprising that they have also been the particular targets of preventive campaigns. From the beginning of the existence of the American Society for the Control of Cancer (ASCC), gynaecologists were prominent in its activities (Patterson 1987: 90). In 1927 its President warned women, "Unfortunately cancer afflicts women in a very much larger proportion than it does men" (Reagan 1997:1780). Not

surprisingly, women were particularly targeted in prevention and early detection campaigns: in 1929, 700,000 copies of the pamphlet, "What every woman should know about cancer' were distributed (Patterson 1987: 91). The 'Women's Field Army', formed in 1936 as part of the ASCC, used the example of breast cancer to promote the virtue of early detection and treatment of cancer (Patterson 1987: 122-123).

Reviewing cancer education campaigns for the general public during the 20th century, Reagan found that they consistently, "….used gender as the primary device for attracting attention and conveying information" (Reagan 1997: 1779). Reagan observes that by the 1950s, "…a gender division of cancer had developed: women got reproductive cancers of the uterus and breast: men got lung cancer" (1997: 1783). The causes of women's cancers were frequently discussed in relation to marriage and motherhood, while men's cancers were never discussed in relation to their sexual activity and experience of fatherhood. Breast cancer, according to one authoritative source merely voicing conventional wisdom, was "…the penalty women pay failing to bear and …nurse children" (Reagan 1997: 1784). Women were doomed either way. Marriage was linked with higher rates of cervical cancer, but failing to enter the marital contract didn't protect women either, since spinsterhood was associated with higher breast cancer rates (Reagan 1997: 1784).

CANCER AND PREVENTION: MYSTERY AND MASTERY

Clearly cancer is a disease that has been linked with the irrational and mysterious bodies of women. However, this does not mean that rational planning and effective medicine cannot successfully address it. Cancer is a mystery, but biomedicine is giving us intellectual and technological mastery over it. The doyen of cancer epidemiology, Sir Richard Doll, comforts us in his canonical work *The Causes of Cancer:*

> From a historical perspective…the rate (of progress) has accelerated so rapidly in the past 40 years that it is reasonable to believe that the avoidable causes of all the principal cancers will soon be discovered and that it will not be long before we can reduce the risk of developing serious forms of the disease from one in three or four, as it is now, to less than one in ten (quoted in Forbes 1990: 1).

In Doll's view, up to 80% of all cancers are preventable, since they are a response to lifestyle and environmental factors that can be changed. Artificially produced carcinogens such as asbestos can be eradicated. Lifestyle factors related to diet, smoking, alcohol consumption,

sun exposure and sexual practices could eliminate many of the most common forms of cancer. This viewpoint, underlying biomedical advice and many public health campaigns, portrays cancer as a 'rational' disease, no different from coronary heart disease. Cancer, for the most part, is not a mysterious affliction of arcane causes and capricious distribution. It is a predictable and potentially controllable response to known and understood causes. The knowledge and technical mastery exists to eliminate most forms of cancer.

Two texts, written by oncologists for the general public, overtly side with Doll in defining cancer as disease amenable to rational understanding and management. The structure of their narratives, however, subverts this sentiment. Both texts begin with a case study, ostensibly to illustrate mechanisms of carcinogenesis, preventive strategies, as well as principles of diagnosis and treatment. Richard's case study describes:

> …a beautiful young girl, fresh and vivacious…sitting upright in bed with legs crossed under her…her long hair flowing over her lovely shoulders (Richards 1972: 42).

This is a portrait of innocence and beauty and its despoilment by cancer. The case study proceeds by describing her study of arts, her marriage to a fellow student, their practice of Zen Buddhism and the birth of their child. This is a life of unrealized promise cut short by the development of breast cancer. The cancer metastasizes and the tale concludes with her death as the inevitable, but not yet imminent, conclusion.

However, there is a glaring contradiction between this woman as 'representative victim' and the epidemiology of cancer. Cancer of the breast is much less common among pre-menopausal than it is among post-menopausal women and it is comparatively rare among women in their early twenties, as this woman was. Taking the rational, predictive approach propagated by Doll, the woman in this story should be over 50, have a family history of breast cancer, be childless, or have had children 'later' in life, be somewhat obese and have a sedentary life. This disjuncture between the predictive power of epidemiology and this portrait suggests that cancer does not follow rational, identifiable 'laws' and is therefore a disease over which we have little control.

An encyclopedic style text published twenty years later also opens with a case-study. This 'victim' is also a young woman (25 years of age), who is married. This woman has Hodgkin's lymphoma. In this case there is a slightly better fit between victim and epidemiological profiles. Hodgkin's disease does affect people in the 15–35 age span. However, it has a

bimodal pattern of onset and it is also very common in the over 50-year age group (Hancock and Bradshaw 1981:139). Moreover, it affects men more than women by a ratio of 2:1 (Miller and Keane 1978: 473). From the rational, predictive approach of epidemiology, the representative victim should have been a man. Hodgkin's disease is not one of Doll's 'principal cancers'. It is relatively uncommon and its aetiology cannot be linked with clearly identified risk factors. Despite have been recognized as a distinct disease for over 150 years, its cause is still unknown (Hancock and Bradshaw 1981: 139).

The barely sublimated logic of these tales is that cancer is a cryptic disease of unknown causes and random distribution. Why have an atypical 'victim' of a common cancer (breast cancer) and / or have comparatively rare, little understood forms of cancer (Hodgkins disease) as case studies? Why begin a book subtitled "Causes, Cures, Treatment and Prevention" with a cancer of unknown aetiology? (Forbes 1990) Surely, these case studies undermine our faith in the ability of cancer to understand and treat this affliction.

Forbes develops the sense that cancer is a general threat that strikes the young and socially valued (wife and mother of two young children, in his case study). However, cancer in Forbes' view is a universal menace; "Cancer affects almost everyone sooner or later" (Forbes 1990:3). This contradicts the epidemiology of cancer that incontrovertibly demonstrates that cancer is overwhelmingly a disease of the aged. The sense that cancer is a universal menace also underlies Forbes answer to his question, "Who needs to know about cancer?" Those he nominates includes:

- The local council
- Factory managers
- Local doctors
- Nurses
- Pharmacists
- Members of Parliament
- Government (Forbes 1990: 2).

In short, everybody needs to know about cancer. Knowledge concerning it is then translated into a call for individual vigilance:

- "Everybody has a responsibility for his or her health" (Forbes 1990: 2).
- "Every family must have informed views about diet and lifestyle" (Forbes 1990: 2).
- "Every citizen should know about prevention, screening facilities and warning signs of cancer" (Forbes 1990: 2).

This is a call for mobilization of society and its members to aid in defeating cancer. Forbes should be lauded for his recognition that a response to cancer must involve more than medicine and individuals. Nevertheless, the choice of Hodgkins disease as a model for mobilization raises some intriguing questions. Why not choose more commonly occurring cancer, of more clearly identified aetiology? The choice of a relatively uncommon malignancy, of unknown cause(s) conveys the impression that we are threatened by a dimly understood entity with only vague, undifferentiated means of responding. A case study that took, say, bowel or lung cancer, might have suggested that these more commonly occurring forms are capable of being understood and countered. Forbes could then have stressed the need for individual change, as well as regulation of the food and tobacco industries. The choice of Hodgkin's lymphoma and the claim that cancer is everybody's responsibility locates the threat everywhere and the solution nowhere. Indeed, Forbes accentuates the apparently universal threat of cancer while emphasizing the essential mystery underlying why particular individuals are afflicted. In a caption accompanying a graphic entitled 'Causation of Cancer', Forbes says:

> Cancer results from playing a game of chance. Everybody is in the game, because everybody is exposed to some of the risk factors. Some are at greater risk than others-in effect spending more time at the gaming table than others…Some escape, despite indulging in high-risk habits, and some whose risk appears small develop cancer (Forbes 1990: 47).

One reason for choosing Hodgkin's disease is that the advances of biomedical treatment can be emphasized. Forbes thus points to the substantial improvements made in its treatment during the past thirty years. While the blanket claim that it is curable is over-stated, significant improvements in survival rates have been achieved. Forbes leaves us no doubt that the ongoing path of medical progress is responsible:

> Mrs M and her husband came to appreciate the sophisticated medical services of Western civilization. Also, for the first time they fully appreciated the benefits of medical research, for Hodgkins disease is a cancer that has become curable only in the last 20 years, as direct result of painstaking studies (Forbes 1990: 1-2).

In this passage, Western civilization, medical science and teleology are seamlessly fused. Only the superior rationality and science of the 'West' could develop the knowledge and technology to understand and treat this form of cancer. While not imputing a conspiratorial motive to Forbes, his work is not free of an evangelical call to salvation through science.

Reading this case study we learn that, despite the mystery and unpredictability of the threat, medical science can save us. It was a theme that had barely altered in the twenty years since Richards had warned his readers not to demand a "…quick, glamorous and single cure…" while simultaneously hailing the "…advance of science…" (Richards 1972: 81). In the face of his cautionary caveat, he insists nonetheless that we are moving, "…from darkest ignorance to more and greater clarity, increased knowledge, and therefore augmented power to prevent and control cancer" (Richards 1972: 82).

This is a 20th Century re-statement of Bacon's 17th Century aphorism that "knowledge is power" with the potential to give humanity complete control over the natural world. Forbes articulates this sentiment "The only way to combat cancer is through knowledge" (Forbes 1990: 2). Forbes' and Richards' 'science as salvation' narratives depend, however, on portraying cancer as an inexorable foe, an insidious and predatory force. Cancer is in many respects to the late twentieth and early twenty first centuries what 'nature' was to 17th Century luminaries; an enemy to be studied, understood and controlled. Bacon's crusade found its apotheosis in the US government's 1971 "War on Cancer". Yet, this is not merely American bellicosity. The Imperial Cancer Research Fund of Britain launched a fund raising drive in the late 1970s asking the public to help them "Fight Back Against Cancer". Cancer is rendered a hostile adversary that must be combated. The best means of winning the fight? — research carried out in laboratories. The material environment in which we live, social practices, cultural values, or even individual habits, are ignored as elements in 'the fight'. Cancer is not a disease we can hope to understand, prevent or treat with non-scientific measures. Rather, researchers uncovering the mysteries of the immune system or the workings of genetic material will win the battle against it. Science remains the weapon for conquest and the path for hope. This has been an unchanging theme in cancer research for the past 100 years, as Patterson demonstrates (1987).

Chapter 5

Coronary heart disease; mechanical bodies, productive agency and rationality

The dynamic language of energy…viewed the worker as a machine capable of infinite productivity…(it)…conceived of the body as both a productive force and as a political instrument whose energies could be subjected to scientifically designed systems of organization (Anson Rabinbach 1992).

It is not the delicate, neurotic person who is prone to angina, but the robust, the vigorous in mind and body, the keen and ambitious man, the indicator of whose engine is always at full speed ahead (Sir William Osler 1910).

PRE-MODERN UNDERSTANDINGS OF THE HEART AND CIRCULATION

Early understanding of the heart and circulatory system came from the Ancient Greeks and was embedded in humoral theory. Well being, indeed life itself, depended on heat carried by blood. Life also depended on *pneuma,* or life force, with which all matter was imbued, and pneuma resided in the heart, which circulated it throughout the body. While Hippocrates believed that the cardiovascular system was circular his understanding was far removed from modern notions of the circularity of the circulation. Hippocrates, for instance, believed that arteries carried air, while veins carried blood.

Galen "…managed to enmesh all the various past suppositions into one complex system…." (Knight 1992:36-37). One ingested, food was converted to chyle in the gut and carried to the liver where it was converted into blood. In Galen's system, the liver was the focal organ of the body because it made blood. Leaving the liver, blood flowed in the vena cava to the right side of the heart. Some blood then went into the lungs through the pulmonary artery. However, the remainer seeped through pores into the left side of the heart where it was heated before being distributed to the rest of the body (McGrew 1985: 64; Knight 1992: 37). While in the left hand side of the heart, blood came into contact with *pneuma* and they combined to form 'vital spirit', which was then distributed to the body via the aorta and other arteries (Miller 1978: 185-187). 'Vital spirit' made arterial blood bright red and much more lively than the darker, thicker and torpid blood found in veins (Knight 1992: 37). In Galen's schema, the principle of blood supply was regeneration rather than circulation (McGrew 1985: 64).

The notion of the heart as an organ forcefully propelling blood is absent from Galen's account. Drawing on the technological models of his era, he conceptualized it as the locale of, "…manufacture and transformation, cooking, brewing and smelting- processes which convert, purify and refine tangible substances" (Miller (1978: 182). Miller asserts that the primary reason for Galen's inability to discern the pumping action of the heart was a lack of 'metaphorical equipment'. Pumps were not a significant or widely used technology in his lifetime, or for the subsequent generations that perpetuated his thought. However, another important dimension in Galen's imagery is that it is pre-capitalist and pre-modernist in derivation. Figuratively, Galen's heart is closer to feudal and monarchical social organization than it is to a capitalist form. The heart, for Galen, is the centrepiece of bodily manufacture; it has sole prerogative to centralize and transform the products of the body's labour. The left ventricle created vital spirits out of air and blood and thus nourished the body as a whole, as well as providing the heat so essential for all areas of the body. The heart was also responsible

for ventilating bodily parts of their wastes. The idea of circulation as a closed system is not yet existent. Nor is there any evidence of conceptualizing the body as a dynamic system operating on the basis of impersonal laws guaranteeing its equilibrium.

As Miller points out, Galen viewed the heart as a lamp rather than as a pump (1978: 187). The heart heated blood as well as transforming it. When blood came to the heart from the liver it was dark and sluggish, but was bright and vibrant when it left. Rather than mere mechanical pump, the heart was, "… an industrial plant half-way between a brewery and a blast furnace" (Miller 1978: 187). Galen's theoretical framework emphasizes:

> …manufacture and smelting–processes which convert, purify and refine tangible substances. The heart, like the liver, is simply another part of the factory. (Miller 1978: 187).

Earlier theorists, including Galen, might just as well discovered the 'truth' about the heart and circulatory system as Harvey did 1500 years later (Magner 1992: 198). However, Galen's era lacked the technology to:

> …assist people's understanding of complex body systems. Galen actually used familiar models where they existed. The mixing of chyle with blood in the liver, for example, suggests a process such as cooking or brewing…But there were no mechanical models, such as the pump…to put even a hint of a pressurized circulating system in his mind (Miller 1978: 182).

The extent to which theory guides perception, rather than observation leading to factual information, can be assessed from the fact that as late as the 15th Century, Leonardo da Vinci drew pores in the septum not because he saw them but because Galen had asserted they existed (Knight 1992: 38). Renaissance anatomists rejected much Galen's theory of anatomy while retaining his view of bodily functions, or physiology (Magner 1992: 190). In some instances, this inability to overthrow much of Galen's system of knowledge reflected an inability to see 'beyond the paradigm'. For instance, Fabrici's *On the Valves of the Veins* (1603) demonstrated that the valves in veins meant blood flowed in only one direction. However, this failed to generate the notion of blood flow occurring in a circular fashion within a closed system (Magner 1992: 196). However, some of the failure to challenge Galen's corpus of knowledge was an outcome of circumspection about challenging the authority of the Church. Servetus, for instance, in *On the Restitution of Christianity* (1553), argued that blood and air mixed in the lungs, not the heart itself, and, once aerated, went to

the heart. This ‘discovery’ of the pulmonary circulation was also a deliberate frontal attack on prevailing theological dogma and Servetus was burned at the stake (Magner 1992: 193).

Air and blood intermingled in the heart, where blood was heated and 'fertilized'. Through this action the body itself was warmed, so the heart acted as a kind of lamp for the body. However the heart also acted in a manner analogous to a furnace. It’s heat generating qualities 'burned off' impurities in the blood (Miller 1978: 183). This purified blood was then enriched or nourished by mixing with air and was also endowed with an extra ingredient, 'vital spirits', before diffusion throughout the body. Galen’s understanding of the heart, prevailing for centuries, was gradually eroded and finally effaced by Harvey’s theory early in the 17th Century.

The modern understanding of the heart and circulatory system is attributed to the ideas contained in Harvey’s *De Motu Cordis* published in 1628. The work, or at least the theory it contains, was completed many years before it was published, but Harvey realized how revolutionary his thesis was and delayed publication, fearing adverse public reaction (Magner 1992: 194). Harvey demonstrated that blood went through the lungs then to the heart; this was the only way of explaining how blood got from the right side of the heart to its left side. Harvey also overturned the long-standing dogma that the crucial activity was the heart’s relaxation, proving instead that it contracted to send blood out into the body. The most revolutionary of Harvey’s insights was that blood flowed through the body in a closed circular system (Magner 1992:194).

While Harvey is justly applauded for the rigour of his method and his logic, he did have the advantage his predecessors lacked. By the early part of the 17th Century, pumps were in relatively widespread use in mining, civil engineering and firefighting. This gave Harvey and his peers a metaphorical repertoire for thinking about the body that earlier generations lacked (Knight 1992: 40; Miller 1978:182-183). Says Miller, “The difference between Harvey and Galen was one of metaphorical equipment” (Miller 1978:187). However, Harvey’s methods were also in harmony with those of the age. His account is largely quantitative; he calculated the amount of blood that a body would contain if Galen’s theory were correct and demonstrated that it was ludicrous (Magner 1992: 195). Moreover, he was an empiricist. Notwithstanding his hesitation over publishing his work, he relied on experimentation not deference to authority. Moreover, Harvey did not seek to uncover ultimate purpose (why the blood circulated), merely to demonstrate that it did. With the advent of the ‘scientific revolution’, Harvey’s method found a congenial environment. (Magner 1992: 196).

THE APPEARANCE OF HEART DISEASE

Just as the 17th Century 'discovery' of the cell laid the foundation for the modern understanding of the body, Harvey's work initiated modern knowledge of cardio vascular structure and function. However, just as the discovery of the cell had very little impact on detailed knowledge of cancer for another 200 years, so Harvey's work did not generate new clinical work on diseases of the heart. Like cancer, coronary heart disease is conceptualized as a quintessentially modern disorder. Nevertheless, narrowing of the coronary arteries has been found in Egyptian mummies (Baldry 1971). Peruvian remains dating from the 1st millennia also exhibit signs of what might now be called coronary heart disease. Furthermore, the Talmud, the Bible and the writings attributed to Hippocrates describe symptoms compatible with what is now deemed angina and myocardial disease (McGrew 1985: 80).

Despite the existence of what would now be considered evidence of coronary heart disease, the diagnostic category did not become recognized until the end of the nineteenth century (Howell 1993:93). Harvey in addition to describing the 'modern circulation' also documented two cases of what contemporary knowledge would deem myocardial infarctions (McGrew 1985: 81). Jean Baptiste Senec's *Traite de la structure du Coeur, 1749,* (Treatise on the Structure of the Heart) provided clinical case studies of cardiac symptoms. In 1761, Morgagni documented post mortem evidence of coronary arteries so hardened and thickened they were like bone (Porter 1997: 581; Baldry 1971: 107).

Heberden coined the term *angina pectoris* , a classic early symptom of CHD, in 1772:

> They who are afflicted with it, are seized while they are walking (more especially if it be up hill, and soon after eating) with a painful and most disagreeable sensation in the breast, which seems as if it would extinguish life, if it were to increase or to continue; but the moment they stand still, all this uneasiness vanishes. (quoted in Porter 1997: 581).

While Heberden recognized the place of exertion in precipitating angina, he also pointed out that emotional upset could bring on episodes (Baldry 1971:109). John Hunter, the famous surgeon and himself an angina sufferer associated anger with many of his episodes and famously declared his, "…life is in the hands of any rascal who chose to annoy and tease me" (Howell 1993: 92; Baldry 1971:112). His observation proved prophetic. Hunter collapsed and died after a dispute over payment with the Board of a London hospital where he taught

(Baldry 1971:112). Post mortem examination showed he died due to coronary thrombosis and narrowed coronary arteries (Baldry 1971:112). For a long period, anatomical perspectives dominated and very little attention was paid to the heart in isolation from the vessels of the circulatory system. Indeed, Hirsch's *Handbook of Geographical and Historical Pathology* (1883-1886) discussed diseases of the heart and vessels and emphasized hemorrhoids (Magner 1992:198).

Auenbrugger used percussion in the mid 18th C to assess cardiac status. However, the notion of disease as localized lesion was not yet canon and Auenbrugger's method did not find a receptive audience (Howell 1993: 91). In the last quarter of the 18th Century, Jenner discerned the role that narrowing of the coronary arteries played in generating the symptoms of angina (Baldry 1971: 110). Over the next one hundred years many forms of coronary heart disease were described, but the first recorded diagnosis prior to death was not made until 1878 (Howell 1993:92). Yet it was not until 1912 that coronary thrombosis generated a published paper. Even so the medical profession was slow in accepting it as a disease category (Baldry 1971: 115). Even in 1892, Sir William Osler considered coronary heart disease to be relatively rare (Porter 1997: 580). Within three decades it was diagnosed in epidemic proportions.

Why has the concept of coronary heart disease not existed since that date, in the light of this 'evidence'? The work of Fleck (1979) and Kuhn (1970) suggests that evidence does not determine what counts as a fact and what counts as knowledge explaining that fact. 'Evidence' only becomes 'evidence' in the context of a thought style or paradigm that makes it both visible and intelligible. It was only in the early part of the 20th Century, with an increasing array of technological innovations enabling greater investigation of cardiac function, that the concept of coronary heart disease and other cardiac disorders were established and began to be frequently diagnosed (Howell 1993: 92; Porter 1997: 583; Daly and McDonald 1997:1043). By 1920 technology such as the sphygmograph, the sphygmomanometer, the polygraph and the electrocardiograph had consolidated the clinical definition of myocardial infarction. (Porter 1997: 583). It is fitting that a disease now conceptualized in such mechanistic terms should have been so reliant on technology to establish its diagnostic respectability. The electrocardiograph was 'invented' in 1903. By the 1920s, clinical definition of myocardial infarction was somewhat consolidated, but accompanied by much debate over the meaning of such technologically derived signs (Porter 1997: 582). Daly and McDonald observe that even with the sophisticated technology now available to provide cardiac images, which should cancel out ambiguity around precise

diagnosis, there remains a significant area of uncertainty about diagnosing heart murmurs (1997: 1044).

THE HEART'S HISTORICAL METAPHORS

It is strange that diseases associated with the heart have not seized popular or professional imagination with images of either dread or reverence. The heart has traditionally been invested with powerful, often quasi-sacred, symbolism. Throughout most of medical history the heart has been designated "the most noble of organs" and it has variously been thought to be the centre of heat, of life, and emotional force (Porter 1997: 580). In the middle ages the term heart (cor) derived from the Greek kardian, or from cura (care, concern): "...in (it) resides all solicitude and the cause of knowledge". Henry of Mondeville, writing in the 14th Century, presages the noble, monarchical qualities attributed to the heart in the early part of the 17th Century by William Harvey. Says Mondeville:

> the principal organ par excellence which gives vital blood, heat and spirits to all other members of the entire body. It is located in the middle of the chest, as befits its role as the king in the midst of his kingdom (quoted in Le Goff 1990: 23).

Christianity contributed compelling dimensions to the heart's symbolism. Not only was the heart the seat of 'vital forces, it was the site of affectivity, interiority, faith and intellectual comprehension. It was also the site for encounters with God, giving it sacred importance (Le Goff 1990: 16). The heart has thus had special symbolic importance, marking the special status of humans, as emotional and morally sensible beings. It also designated passion and, particularly in the 17th Century, was symbolically equated with bravery (Baldry 1971: 105).

It also had another important set of metaphorical dimensions. Beginning in the 13th Century, the heart was used to describe and justify monarchal governance. The heart was metaphorically associated with the Prince; the source of laws and ordinances ensuring justice for the kingdom (Le Goff 1990:20-23). This metaphor had a particular political pungency for Protestant England, implying the primacy of the State over the Pope. Harvey was still asserting the figurative association of the heart and monarch early in the 17th Century (Harvey 1957: 108). The King and the heart are the productive sources and channels of their respective kingdoms. From their nobility and beneficence the kingdom is supplied with the elements necessary for it's well-being.

During the 17th Century the heart was gradually stripped of the accretions symbolically expressing moral sensibility and the rightful place of the monarch. More rationalist, mechanical ones superseded them. It is a matter of speculation, but had the heart not been denuded of these charged images, would heart disease, like cancer, have been described by lurid metaphors of devourment and contamination? Harvey 'discovered' the propulsive action of the heart by comparing it to a water pump widely in use at the time. He also 'discovered' the circulation of blood within a closed system in which backflow was prevented by a series of strategically placed valves. However, Harvey caught only the beginning tide of the mechanical view of the universe and currents of vitalist thought remained in his thinking. Though Harvey conceptualized the heart as an agent of mechanical propulsion, he nevertheless accorded it a reverence not demanded by a mere pump. Like earlier chroniclers, he invested it with princely, almost mystical, qualities:

> The organ deserves to be styled the starting point of life, its chief member, the sun of our microcosm... For it is by the hearts vigorous beat that the blood is moved, perfected, activated and prevented from injury and coagulation. The heart is the tutelary deity of the body, the basis of life, the source of all things, carrying out its function of nourishing, warming and activating the body as a whole (1957: 59).

Later in the work he insists:

> Just as the king has first and highest authority in the state, so the heart governs the whole body. It is, one might say, the source and root from which in the animal all power derives, and on which all power depends (1957: 108).

The heart is still the monarch, the focal point and foundation of the bodily kingdom and its action is the pre-requisite for the kingdom's life. The heart is imbued with 'authority'. It not only circulates blood it perfects it and protects it from coagulation. Like a good monarch, the heart has moral and physical power, essential to the life of the kingdom; it is the body's *anima mundi*. Harvey, while recognizing the idea of circulation, has not yet discerned a differentiated body where constituent components have autonomy from the "...Prince in the Commonwealth....", functioning in accordance with impersonal laws attuned to systemic performance.

There is a core difference in understanding the heart as a kind of lamp or furnace, simultaneously manufacturing and vitalizing blood, and regarding it as merely the focal point and agent of its distribution. Post-Harveian understandings of the heart increasingly denuded it of any role except efficient distribution and circulation, its prerogative as the core of moral authority and the centre of bodily enterprise is gradually displaced. In this newly emerging conceptual framework, the heart no longer needs to exercise 'authority', to protect the blood and prevent its coagulation, or to warm and vitalize the body as a whole. That is, it no longer needs to exercise moral and political power as the body's monarch. Instead it acts, much like Adam Smith's 'invisible hand', to facilitate circulation (Smith 1776: Book Two).

Understanding of the hearts' anatomy and physiology became less vitalist and more mechanical as the 17th Century passed. Digby, writing in mid-century, was more concerned than Harvey before him to describe the interdependence of bodily organs, using the metaphor of a machine whose efficient functioning is dependent on the concert of component parts. The idea of the heart as monarch is absent from his speculation (Sawday 1983: 22). This is a vision of the body that stresses differentiation and interdependence. This body, much like the newly emerging society of the time, devolves absolute power from the monarch and diffuses it to semi-autonomous organs or systems that act to maintain the patency of the overall system. Nevertheless vitalist strains remain in his thinking about the heart as on organ within this differentiated system; for instance he still believed it generated heat (Sawday 1983:26).

By the last quarter of the century vitalist thought about the heart had been all but replaced by mechanical metaphors. Not only had mechanical images become increasingly dominant they had also been increasingly intertwined with economistic tropes. Just as Digby had, Charleton used the metaphor of the mint at Segovia to explain cardiac function. The body as understood by Charleton, (writing in the last quarter of the century), is virtually free of vitalist qualities or impulses, rather it is an automaton and in looking at it we can see:

> the most abstruse oeconomy of nature in the body of man; a system of innumerable smaller engines, by infinite wisdom fram'd and compacted into the one most beautiful, greater automaton (quoted in Sawday 1983: 28).

Charleton was concerned to elucidate the homology of the body and the minting machine by stressing the idea of circulation. The mint of course made money that was "...the blood of all

states, as well (as) monarchies as (well as) republicks for the support of the government....” (Sawday 1983: 29). Certainly the heart had to “...stamp the character of vitality....” on blood (quoted in Sawday 1983: 29). But, for Charleton, unlike earlier writers, the role of the heart in vitalizing blood was secondary to its task in distributing it throughout the ‘animal oeconomy’. This parallels changes in a society that increasingly relied on markets, not the monarch, for its effective operation. It was unimpeded circulation, not centralized power exercised toward its own ends, on which society was increasingly dependent. Monarchical power is progressively redundant, if not obstructive, in this new society. Sawday (1983: 31) observes that Hobbes also figuratively related the flow of money the economy to that of blood throughout the body. Economistic understandings of circulation were obviously a widely used analogy by mid century. Adam Smith, by 1776 in the *Wealth of Nations,* was describing his account of the circular economy of input and output as a 'physiocratic model' (1776: Book Two).

The changing understanding of cardiac anatomy and physiology parallels ascendant capitalism and documents the progressive entrenchment of the ideas generated during the ‘scientific revolution’. Put briefly, dominant streams in 17th Century thought increasingly adopted a mechanical view of the natural world and endorsed scientific laws as the means for its comprehension and control. The development of capitalism cannot be separated from the intellectual changes of the era. In the emerging capitalism, the market, not the monarch, controls the circulation of money; unimpeded circulation was increasingly demanded in the new economic order. The eventual dominance of conceptualizing the heart through imagery that was simultaneously mechanical and economistic reflects and reinforces the emergent society and its ideologies. The changing material conditions of society challenged existing social organization and made its legitimacy a subject for debate. Three of the century’s most influential theorists—Hobbes, Locke and Rousseau—all criticized the ideology that insisted social order was grounded in nature, or natural right, and was therefore immutable (Martin 1989). This was an open attack on monarchical power. This is reflected in changing perceptions of the body. It was understood to be less dominated by the 'tutelary deity' and was regarded instead as a differentiated entity that nonetheless functioned as a systemic whole. Digby argued that:

> …though every part and member be, as it were, a complete thing of itself, yet everyone, requireth to be putt on its motion by another...for the use and service of the whole (Sawday 1983 :26).

CONTEMPORARY DEFINITION OF THE HEART

The noble, virtuous and generative qualities imputed to the heart by Harvey and others of his generation are absent from contemporary description of it. Texts typically refer to it as "a hollow muscular organ" (Ross and Wilson 1973: 138; Tortora and Anagnostakos 1981: 460; Miller and Keane 1978: 445). The heart is no longer described as if it acts like a pump; it is a pump. This is presented as literal description, not metaphorical understanding: "... this small, powerful pump...." (Luckman and Sorensen 1980:760); a "hard working muscular pump" (Borushek and Borushek 1981: 7); "It is the pump that maintains circulation of blood throughout the body" (Tortora and Anagnostakos 1981: 460). While the heart and cardio vascular system are applauded for their unceasing productivity, they remain a disenchanted bodily system, "It is merely a plumbing system in which the circulation of blood through a series of pipes (blood vessels) is powered by a pump (the heart) (Borushek and Borushek 1981: 7). Not only is the heart and cardiovascular system merely a machine, it is one that is understood in economic terms as the focal point of distribution. The heart facilitates exchange in a way that balances supply and demand. Most anatomical description disaggregates the heart describing it as two pumps, different in structure and function and serving different parts of the body. The right side of the heart services the pulmonary circulation. It receives deoxygenated, 'oxygen-poor', or 'oxygen-used' blood returning to the heart after use by cells throughout the body (Miller and Keane 1978: 445). The blood passes through the right atrium and ventricle and is then directed to the lungs for re-oxygenation. The left side accepts this 'oxygen-rich' blood from the lungs and channels it to the systemic circulation for use by the body. Cells 'exchange' oxygen rich blood for oxygen poor blood. That is they receive fresh nutrients in exchange for metabolic wastes (Miller and Keane 1978: 445).

The heart no longer has primacy in thinking about the body as it did in Harvey's schema; its place as monarch has been abolished in favour of understanding of the body as dynamic, mechanically operating market in which the heart is merely a component. Conceptualizing the body as a series of systems acting in concert to maintain the equilibrium of the whole assumes a telos of production. Cells, the body's most basic structural and functional unit, need oxygen and other nutrients to metabolize; they must also be able to rid themselves of metabolic wastes. Blood is the medium that transports oxygen and other substances to cells and carries away their wastes. Bodily well-being and productivity are dependent on circulation of blood and the structures that facilitate circulation. Corporately these are known as the cardiovascular system. The language describing it is permeated by economistic tropes. Though every cell needs oxygen, it "... requires a balance of supply and demand" (Miller and Keane 1978: 737).

Both surfeit and deficit are harmful. It is the heart that regulates supply and demand, providing the balance of input and output cells require.

The demand for oxygen by tissues and cells is not static and the heart must be able to respond by increasing or decreasing supply. During times of stress, illness or physical exertion, cells require more oxygen and must rid themselves of wastes more quickly. The heart accommodates this increased demand by beating more rapidly. Conversely, demand is reduced during times of rest and the heart responds by beating less rapidly. In some circumstances however supply and demand do not balance. Unusually vigorous exercise, for example, may create a demand for oxygen that is so great, the heart is unable to meet it. In these cases cells and tissues experience 'oxygen debt'. That is, they continue to function despite their unmet demand for oxygen, this state can only be sustained for short periods (Miller and Keane 1978: 445).

The regulatory activity of the heart is an outcome of objective laws of physiology and anatomy. The heart has no agency in its action; it merely performs as a piece of machinery. The pacemaker, an electrical conduction system within the heart, sets the rate of heartbeat. So perfectly mechanized is the heart, that given the right conditions, it can continue to beat even if removed from the body. In the absence of nervous system stimuli, the pacemaker sets a pulse rate that is utterly unvarying (Tortora and Anagnostakos 1981: 475). However the heart does not even exercise agency in responding to altered supply and demand requirements. Pulse rate is increased by sympathetic nervous system stimulus, while it is lowered through the action of the parasympathetic arm.

So thoroughly is the heart construed as a regulatory machine in the bodily economy, its performance can be precisely quantified. Each heartbeat takes exactly 0.8 seconds (Tortora and Anagnostakos 1981: 472; Ross and Wilson 1973: 145; Luckman and Sorenson 1980: 765). A time and motion schema, of Fordist precision and predicability, calculates the hearts productive output within a given time frame. Cardiac output, the amount of blood dispatched to the circulation each minute, is calculated by a formula:

> Cardiac Output = Stroke Volume x Pulse Rate (Tortora and Anagnostakos 1981: 474).

Cardiac output quantifies the amount of blood sent into the circulation per minute. Cardiac index, on the other hand, is a more accurate calculation of the amount of blood actually supplied to cells and tissues:

> Cardiac Index = Cardiac Output x Square metre of body surface (Luckman and Sorenson 1980: 765).

Cardiac reserve is another measure of the heart's capacity for performance. This gauges the capacity of the heart to increase its output in the face of abnormally increased demand for oxygen. If, in unusually vigorous exercise, the heart rate increases to four times its normal rate and output, cardiac reserve is 300% (Tortora and Anagnostakos 1981: 474-475).

Descriptions of the heart in anatomy and physiology texts stress its efficiency, productivity and reliability - all qualities of good machines:

- It is "...capable of continuous rhythmic contraction without tiring...."(Miller and Keane 1978: 445).
- (the heart pumps blood) "...through literally thousands of miles of vessels...." (Tortora and Anagnostakos 1981: 465).
- "…this virtually tireless machine pulsing through every minute of life from birth to death, never stopping for rest or repair." (Luckman and Sorensen 1980: 760).

One textbook applauds the heart's productivity, as well as its stamina:

> The work done by the heart is out of all proportion to its size...Even while we are asleep the heart pumps...75 gallons per hour. In other words, it pumps enough blood to fill an average gasoline tank every hour just to keep the machinery of the body idling. When the body is moderately active, the heart doubles this output...over the 24 hours of an average day, involving not too vigorous work, it amounts to some 70 barrels and in a lifetime of 70 years the heart pumps nearly 18 million barrels (quoted in Luckman and Sorenson 1980: 760).

Another description emphasizes the utter reliability of the heart as it continues to carry out its functions effectively and unceasingly. Not only must it continue to work efficiently, it must

be able to respond to increased demand by increasing supply. This 'modern' heart is no monarch, vitalizing and warming its bodily kingdom, protecting the blood; it is the embodiment of market place laws of demand and supply:

> The human heart beats approximately 72 times per minute...this small powerful pump contracts between 70-80 times *every* minute of *every* day throughout a person's lifetime, resting only 0.4 of a second between beats. Unlike other muscles of the body, the heart cannot stop and rest when tired and worn from work...it must keep pumping regularly, continuously and with sufficient force...it must also be able to *increase* its work output four or five times the normal if it is to sustain the body during periods of stress (Luckman and Sorenson 1980: 760; emphasis in original).

This is the modern Cartesian body par excellence. It functions on pre-ordained and immutable laws of matter and motion, a bodily physics. This body has no mysterious or irrational propensities threatening the rational agency of the actor who inhabits it. The heart has been denied any intrinsic character or identity; this is a machine without a ghost. The prosaic, un-emotive and, ostensibly, non-metaphorical language and concepts associated with coronary heart disease can be seen in the titles of biomedical books on coronary heart disease. Whereas titles on cancer refer to 'the savage cell' or 'the misguided cell', there is no equivalent heart disease text explaining 'the savage artery' or 'misguided cholesterol'. Indeed, the titles are as pedestrian as the cardiovascular system is presumed to be.

Table 5.1: Coronary heart disease titles[1]

Author	Date	Title
Abshagen U	1985	Clinical pharmacology of antianginal drugs
Califf R and Wagner G	1986	Acute coronary care
Davidson R	1985	Coronary heart disease: contemporary patient management
Haft J and Berlin S	1979	Consultation with a cardiologist: coronary heart disease and heart attacks: prevention
Keys A	1980	Seven countries: a multivariate analysis of death and coronary heart disease
Morris S	1987	Coronary disease: medical subject analysis with reference bibliography
Rahimtoola S	1982	Controversies in coronary artery disease
Shillingford J	1981	Coronary heart disease: the facts

[1] I consulted a bibliography, 'Medical and Health Care books in print'and looked up 'Coronary heart disease'. The list was too extensive to reproduce verbatim, therefore I chose every tenth title. I stopped at this juncture, feeling the point had been made.

HEART ATTACK: DEMAND AND SUPPLY DISRUPTED

If cancer is conceptualized as an expression of deviance, CHD is construed as mere mechanical malfunction. In more economistic terms, if cancer represents rampant, unbridled production, coronary heart disease figuratively expresses disruption of supply and demand. As one text pronounced:

> The pathogenesis of all forms of IHD (ischaemic heart disease) at the most fundamental level is an imbalance between myocardial oxygen supply and demand" (Luckman and Sorensen 1980: 840).

The single most important factor occasioning this disruption is insufficient blood supply to the myocardium (the middle and most muscular layer of the heart) through the coronary arteries. The decreased supply of blood is caused by atherosclerosis (the gradual accumulation of fatty deposits within the coronary arteries) and usually develops over a long period. Initially, atherosclerosis is a silent process and symptoms are not manifest until there is a 'critical deficit' in supply relative to demand.

This process, like many aspects of our knowledge about the heart, can, putatively, be predicted and calculated through objective laws. The axioms of physics claim that flow of liquid through a pipe will not be significantly impeded unless the pipe is at least 50% blocked and then only circumstance of high flow requirements. Blockage of at least 75% must exist for movement under normal circumstances to be impaired. Symptoms (angina, myocardial infarction or sudden death) are only manifested at this point. This is an unambiguously mechanical conceptualization of coronary heart disease. It is merely obstruction of a "pipe" which disrupts, albeit very seriously, the mechanism of demand and supply. Many explanations of atherosclerosis have been proffered; it is part of the aging process, it is an outcome of stress produced by modern life, hormonal factors are important, while others contend that viral, or other toxic agents are the cause. The explanation that has gained pre-eminence in both popular and professional circles, however, is the 'lifestyle' theory (Hetzel and McMichael 1987; Australian Institute of Health and Welfare 1996: 101-104). While this account does not deny the influence of family history, gender and age as risks for CHD, it holds that three elements of our lifestyle are the most significant and are modifiable risks: smoking, elevated serum cholesterol and hypertension.

That CHD has not generated a pejorative mythology probably requires as much explanation of the fact that cancer has. However, a full pursuit of this line of inquiry lies beyond the purview of this thesis. By the 1930's CHD was an epidemic in capitalist democracies: a status it has maintained. As late as 1982, almost one out of every three deaths in Australia was due to heart disease. Heart disease, causing 28% of deaths, made a greater contribution to mortality than cancer, which accounted for 22% of deaths (Australian Bureau of Statistics 1984).

Cancer, despite being less prevalent than heart disease or other causes of morbidity, nevertheless generated more dread than heart disease. Presaging the 1970s action of the American Government, a 1943 *Australian Women's Weekly* editorial jubilantly announced a "War Against Cancer". Even typhoid was regarded with more horror and hostility than CHD; describing typhoid as a "menace", readers were encouraged to avoid "...spread(ing) the evil" (*Australian Women's Weekly* 1943: 10). A later article on heart disease offered the more encouraging and optimistic advice to "Guard Your Husband's Heart" (*Australian Women's Weekly* 1948: 20).

This epidemic of heart disease—silent, unpredictable and very often lethal—did not attracted the same fear and loathing as cancer. A 1939 American Gallup Poll asked its respondents "Which of the following diseases would you hate most to have"? The responses demonstrate the special dread accorded cancer:

- 76% cancer
- 13% TB
- 9% heart trouble
- 2% pneumonia (Patterson 1987: 112).

It is difficult to explain the degree of fear associated with cancer according to rationalist tenets, because by this time coronary heart disease was killing many more Americans than cancer was. Despite the fact that heart disease was a more common affliction, had few warning signs and frequently caused death almost instantaneously, response to it was more sanguine than that toward cancer. Coronary heart disease accounts for just over 30% of mortality in contemporary Australia, while deaths due to cancer accounted for just under 30% of mortality (Australian Institute of Health and Welfare 2000: 31). In 1996 in Australia, coronary heart disease was still responsible for more years of life lost than cancer (Mathers et

al 2001: 1080). Moreover, both cancer and coronary heart disease are overwhelmingly diseases of the aged. The median age at which cancer was diagnosed in Australians is sixty-seven years (Australian Institute of Health and Welfare 2000:9). The rate of myocardial infarction peaks in those aged seventy-five to eighty-four, while seventy percent of those who die from CHD are aged seventy-five or over (Australian Institute of Health and Welfare 2003).

LIFESTYLE THEORIES OF CORONARY HEART DISEASE

Most of the thinking, taking lifestyle as its focus, ultimately locates the genesis of CHD in an imbalance between supply and demand. On this reading, coronary heart disease is a disease of irony, if not paradox. Angina (chest pain due to inadequate oxygen supply) and myocardial infarction (death of heart muscle) are the consequence of inadequate blood supply to the myocardium, but this has its origins primarily in over supply of food to the body, relative to demand. The language discussing this, alleged, over consumption is laden with moral judgement of modern individuals and their way of life.

Russell Gibbs, writing in the late 1970's, attributed Australia's increased incidence of CHD to smoking, sedentary lives and changes in 'Western' diets. The book in which he outlined these charges contained a forward by the then President of the Australian National Heart Foundation, thus implying their endorsement of Gibb's position. Gibbs notes a, "...world wide boom in cooking, with the emphasis on gourmet dishes...." (Gibbs 1979: 14). Not only is our intake of food excessive, we eat complex in preference to simple foods. Proceeding apace with these dietary changes, the prevalence of manual labour declined. The problem, as Gibbs frames it, is that our diet has not accommodated changed work patterns; the supply of energy exceeds demand. Continuing the indictment of corrupt modern living, Gibbs laments machines and time saving devices which facilitate our comfort and to which our bodies have responded with, "...inactivity, obesity and other adverse effects" (Gibbs 1979: 19). Gibbs makes three claims about obesity, all of which pivot on the centrality of balancing demand and supply:

1. Obesity occurs when there is imbalance between food intake and energy expenditure.
2. If more calories are consumed than energy expended, obesity will result.

3. Weight loss can only be accomplished by excess of expenditure over food intake (Gibbs 1979: 21).

This is a statement about the mechanical body that needs certain substances in relatively precise quantities for optimal function. The first two precepts are also, not incidentally, a manifesto for appropriate consumer activity in the body politic. Hetzel and McMichael, (1987) writing a decade later, renew the theme of decadent modern lifestyle. Juxtaposing the image of a cave-dweller and supermarket consumer, they suggest our bodies are ill-equipped to cope with the kinds and amount of food we consume. Reiterating the theme that the body is a machine requiring precise types and quantities of certain substances, they argue that we are older model engines function well on ordinary fuel, but malfunction when supplied with super (Hetzel and McMichael 1987: V111). Using contrasting images, modern and male lives and bodies are compared with earlier, more natural ones. Not only do we eat the wrong kinds of food in excessive quantities, contemporary social life has eliminated physical activity from routine activities:

> Game can now be stalked, at leisure within the butchers shop; man's predators are seen only in zoos...most human migratory activity is by car or plane and competitive courting...is more likely to depend on money than muscle (Hetzel and McMichael 1987:17).

CORONARY HEART DISEASE: A MALE DISEASE

Just as cancer is subtly given a gender association, so too is coronary heart disease. It is archetypically a male disease. Traditionally, men have been considered at higher risk than women and middle-aged men, especially executives who work too hard, have been the exemplar victims. In 1948, The *Australian Women's Weekly* (1948: 20) was using the blue suited, middle-aged man as CHD's archetypal victim of sudden, unforseen heart attack death; a theme still reiterated in the '90's.

In 1948, the *Australian Women's Weekly* was continuing Osler's association between vigorous men, engaged in useful activity and coronary heart disease:

> The man in the blue serge suit was puffing a little as he reached his seat in the train. "Pretty fair sprint for a man of fifty one. Haven't

> missed the 8. 05 this month. I'm in great shape. The old heart hasn't bothered me for ten years" (*Australian Women's Weekly* 1948: 20).

His statement is a kind of prophecy in reverse and he promptly dies of a heart attack. The article noted that the newspaper carrying this man's death notice also carried obituaries for other heart attack victims; an eminent scientist, an ambassador and a travelling salesman. The *Weekly* deplored the fact that these men worked too long and hard in their offices. While the *Australian Women's Weekly* also berated women over the age of fifty who placed themselves at risk of heart attack. In so doing, they were selfishly threatening to leave their husbands and children without wife and mother.

The *Weekly* noted that, "Every day hundreds of vigorous successful men in their forties and fifties are struck down by coronary thrombosis or angina pectoris at the very peak of their usefulness (1948: 20). *The Australian Women's Weekly* demonstrated the gravity of the threat by observing that heart disease killed, "...three times oftener than cancer, six times oftener than accidents and more than ten times oftener than tuberculosis" (Australian Women's Weekly 1948:20).

However, the *Weekly* quickly re-assured its readers:

> But almost everyone has a second chance. The encouraging medical fact is that 80% recover from a first attack of coronary thrombosis...The heart is a strong organ with a great capacity for comeback (*Australian Women's Weekly* 1948:20).

However, this association of coronary heart disease with masculine activism is not the exclusive province of popular journalism, it has its genesis in biomedical thinking about the disease. As early as 1910, two decades before coronary heart disease was recognized as epidemic, Sir William Osler announced:

> It is not the delicate, neurotic person who is prone to angina, but the robust, the vigorous in mind and body, the keen and ambitious man, the indicator whose engine is always at full speed ahead (quoted in Baldry 1971: 117).

Coronary heart disease has never been associated with the repressed, the irrational or the weak. More particularly, it is not a disease associated with irrational bodies and irrational subjects. This is not a disease of flawed subjectivity but of rational, productive agency. It not only afflicts those of healthy mind and body, but those who use these attributes for instrumental and productive purposes. Coronary heart disease is archetypically a disease of rational middle-aged men engaged in productive pursuits. Such men are credited with creating the wealth of their societies and are their most valued members.

In a 1970s history of heart disease, Baldry re-echoed elements of Osler's claim about the kind of men likely to be afflicted with coronary heart disease. While Baldry (a physician himself) could not discern a particular personality type among those with coronary heart disease, these men, in his observation, did share certain physical characteristics, "…predominant maleness, muscularity and compactness" (1971: 122). An American cardiologist also considered that his coronary patients were more 'robust' and 'masculine' than those without the disease (quouted in Ehrenreich 1983: 79). It was identified as a 'disease of affluence' and, more tellingly, 'the executive disease'. The, "…man at risk is a successful upper-level white-collar worker and a responsible family man" (Ehrenreich 1983: 71).

Men's risk is excusable; they must provide for their families and society requires their public sphere activity. It is almost as though men have very few options about the risks of coronary heart disease they encounter; they are imposed by their social position. The white-collar worker became the exemplar of the heart attack victim; despite there being higher rates of CHD among blue-collar workers. White-collar work is skilled, valuable and involves responsibility. Such men, the archetype of the good worker, would not leave work until the job was finished, they are imbued with the Protestant work ethic and are reliable and diligent, if occasionally stressed, workers. Coronary heart disease is a rational response to rational action on the part of men. Women, on the other hand, are 'selfishly' placing their families at risk (Ehrenreich 1983: 73). Men are innocently victimized by the demands of rational agency. Who should safeguard men? Clearly the *Australian Woman's Weekly* laid the responsibility at the feet of women, enjoining them to "Guard your husband's heart". This theme, of men being unwilling and unwitting victims, was still being articulated in the 1970s. Those at greatest risk of coronary heart disease were those in sedentary occupations that entailed stress. The extent to which men are exempted from responsibility is evident in Gibb's advice that, "… the wife of a farmer or labourer should realize that if her son has a sedentary job he will require fewer calories than his father" (Gibbs 1979: 19).

Coronary heart disease is a disease that upholds a distinction between the public and private domain, and appropriate gender roles within them. Men do, and should, work in the public domain, despite the fact that it carries some risks, but women, within the private sphere, should help minimize the risks men face by not only cooking the right kind of food, but also making sure men don't get more than they need. Men may have mechanical bodies, requiring a balance of supply and expenditure of energy, but women are responsible for the maintenance of these finely tuned apparatuses.

Coronary heart disease became, and remains, emblematic of a mechanical body employed toward rational, productive ends. While other ailments may have indicated flawed character or ignoble activity, coronary heart disease indicated hard work and status, its sufferers could hardly be made culpable. Gibbs describes the 'us' (men) who have a heart attack as, "…victims of the world we have created" (1979: 14). Coronary heart disease was labeled by two South African cardiologists as the "…the scourge of Western civilization" (quoted in Ehrenreich 1983:71). Kowalski creates a portrait of a man at risk of coronary heart disease. This is a man threatened by his own productivity, his rationality and his mechanical body, as well as the demands placed upon him, not by a body with irrational, anarchic properties:

> John Public is roused …from a fitful sleep in which he was dreaming about his mortgage and unpaid bills. He turns on the radio to hear that traffic is building up on the freeway he travels to work on. Having rushed through his shower, John cuts himself shaving while hearing his wife Joan yelling at the kids. Arriving at work, he finds that an extra meeting has been scheduled, his boss is angry that he is ten minutes late, and a pile of mail and messages is thrust in his hand by the secretary even before John can put down his briefcase. The day at the office is a series of crises with a liberal sprinkling of internal politics. Lunch and coffee breaks are devoted to a continuation of work discussions…Arriving home he finds that the washing machine has broken down, one the kids is flunking school, and the other is dating someone best described as Hell's Angel. There was no time to prepare dinner, and the decision is whether to order sausage or pepperoni on the pizza. John's mother calls and can't understand why he's not happy to hear from her, since he never bothers to telephone. Two martinis later the pizza arrives and John washes it down with a couple of beers while watching television. Exhausted from the day he never leaves the couch. Yet when its time for bed, John has difficulty

> falling asleep and finally resorts to a pill that leads to another drug forced unconsciousness, which ends as the alarm signals another day like the one that preceded it (Kowalski 1992: 39-40).

'Stress' became the 1950s paradigm for explaining the high rates of coronary heart disease and the increasing public awareness about it (Ehrenreich 1983: 73-78). The stress theory of heart disease soon became translated, in the late 1950s and 1960s, into the concept of the type A personality, making it more 'measurable' and, therefore ostensibly, verifiable. However, despite the ostensibly gender-neutral concept of 'personality', the type A theory was actually an account of a certain kind of masculine behaviour. First enunciated by cardiologists, Friedman and Rosenman, the type A behaviour pattern exhibited the following characteristics:

- An intense drive to achieve self identified but poorly defined goals.
- Eagerness for competition.
- Persistent desire for recognition and achievement.
- Involvement in multiple activities with deadlines.
- A tendency to accelerate physical and mental functions.
- 'Extraordinary' mental and physical alertness (Helman 1987: 969).

It is noteworthy, given the list outlined in the table above, that only 'real' men (that is, heterosexual ones) were at risk. One American psychoanalyst with an interest in coronary heart disease comforted the vast army of 'normal masculinity' by pointing out that:

> Transsexuals …apparently will not die of coronary disease… They have cured the problem of their cholesterol, their uric acic, their sugar, their phospholipides… the heart goes scot-free in girlish ways. The stress endured by the robust and masculine is over (cited in Ehrenreich 1983: 80).

Real men were men who worked hard in the competitive and stressful public arena. Friedman and Rosenman attributed this behaviour pattern to stress, "…never previously witnessed in any previous age of society" (quoted in Helman 1987: 970). Yet, though this behaviour may have had toxic health consequences, it was socially rewarded with high income and social prestige. It thus affected men more than women because of their location and activity in the public sphere. As the alleged differential rate of coronary heart disease among men and women showed, the ability to remain within the private sphere of domesticity conferred health benefits on women. It is moreover due to the demands of 'Western' culture, since Japanese men did not suffer nearly the rates of CHD that their American counterparts did (Helman

1987: 970). Helman, in his discussion of the values associated with type A behaviour, concluded that they in fact juxtaposed 'Western' masculinity with attributes usually associated with the 'other':

Table 5.2: Gender and culture norms/orientations associated with Type A and B behaviour patterns

	Type A behaviour pattern	**Type B behaviour pattern**
Gender and cultural orientation	Modern	Traditional
	Western	Non-Western
	Urban	Rural
	Public	Private
	Money	People
	Men	Women

(amended from Helman 1987: 976)

Gibbs also conveys the sense that men are victims of the modern 'West':

> In so-called backward countries where man is forced to live largely by his own resources, nay power that he has is produced primarily by his own heart, lungs and muscles…Food in these communities is also much less refined or complex than in Western society, nor is there so much of it; the whole way of life is much simpler and emotional stress is much less (Gibbs 1979: 19).

The theory of the type A personality articulated many of the concerns clustering about coronary heart disease. Yet as Ehrenreich makes clear the refrain of men as victims of CHD entailed a less frequently articulated charge that they were victims of women's consumerist insatiability (1983: 77). Men were working hard, entailing long, stressful hours in the competitive atmosphere of 'the office', set within the wider corporate world. However, they did so to provide for their wives and children. A story in *McCalls* in 1964 chronicled five 'CHD narratives' and gathered them under a heading emphasizing the sheer wastefulness of coronary heart disease: "Five men who might have lived". These men were successful in their chosen fields and their earning power matched their achievement, but they were clearly driven by women who were depicted, as Ehrenreich points out, as either demanding or infantile. Joseph Fowler, a victim of typical virtue, "…worshipped (his wife) Muriel… Alone, he managed their financial affairs, paid the bills, gave her a weekly allowance…." (Ehrenreich 1983: 77). Another obituary clearly held the greedy wife and children culpable:

> He worked hard, stopping only for a sandwich at his desk when he was not lunching with clients. You have to work hard to live as the Langdons did. Mrs Langdon dressed exquisitely. Their two sons attended expensive prep schools (quoted in Ehrenreich 1983: 77).

However, the wife's part in driving this frenzy of work is made apparent by Mr Langdon's inability to comply with the low fat diet his doctor prescribed. "How", he asked his physician, "can I eat grass for dinner when she has a steak with bearnaise sauce"? A final display of irresponsible wifely behaviour precipitates the husband's premature demise:

> Mrs Langdon showed her husband the leopard coat she had just purchased. He upbraided her for being extravagant. They both yelled. In the middle of a cutting remark, he sat down hard in a chair. He never got up (quoted in Ehrenreich 1983: 77).

However, this association between hard working men and the development of coronary heart disease is not confined to populist sensibility. A British physician in 1990 articulated the perception of his patients that; "A heart attack is a status symbol of high powered business men …(as) proof that success has been won by hard work" (Advertiser 23rd August 1990: 1).

CORONARY HEART DISEASE: MYSTERY AND MASTERY

Biomedical knowledge about cancer subtly presents it as a fundamental mystery while nevertheless conveying a more overt message about how much progress has been made in understanding and treating the disease. By contrast, biomedical knowledge about coronary heart disease presents it as a disease whose ultimate causes and mechanisms are well understood. Furthermore it is presented as an ailment that is amenable to treatment that is routinely highly effective. Coronary heart disease holds few fundamental mysteries. Its causes are understood and can, according to biomedical rhetoric, be prevented by appropriate lifestyle changes. For those who develop CHD there is effective treatment, we are told. However, the picture of rational and technological mastery over coronary heart disease is not completely sustained by empirical evidence.

Coronary heart disease is a major public health problem in Australia. It accounted for 22% of all deaths in Australia in 1998 and constitutes the largest single cause of death (Australian Institute of Health and Welfare 2001: 22). For a forty-year-old man, the risk developing CHD at some point in the future is one in two; for women over forty, the risk is one in three (Australian Institute of Health and Welfare 2001: 23). Yet despite the high prevalence of CHD and the potential morbidity and mortality it entails, it remains associated with a degree of confidence and optimism not associated with cancer. John Dwyer, an immunologist and

one of Australia's most high profile medics, writes; "We know we can survive a heart attack, we may indeed live with it, but cancer? How many people do we know who have been cured of cancer"? (Dwyer 1993: 111).

Heart disease does not seem to generate the fear and dread evoked by cancer. Yet survival rates post myocardial infarction are lower than those for many commonly occurring cancers. Of those Australians who have heart attack, 40% die within a year of the occurrence and over half of those who die do so before they even reach a hospital (Australian Institute of Health and Welfare 2001: 20). That is, despite well-documented improvements in treatment of coronary heart disease and its effects, four out of every ten people who have a heart attack will die within twelve months of the event. Some forms of cancer do have less favourable five-year survival rates than those of coronary heart disease. Lung cancer, for instance, has a five-year survival rate of 5-7%. Other forms with poor outcomes include stomach cancer (approximately 10% five year survival), cancer of the oesophagus (about 6% survival at five years) and cancer of the pancreas, with a five- year survival rate of just 2% (Mayor 2003: 72). However, all of these forms of cancer are relatively uncommon forms. For more commonly occurring forms of cancer, five-year survival rates are far higher; 80% for breast cancer, 60% for prostate cancer and between 40% and 80% for large bowel cancer, depending on the stage at which it is diagnosed. (Mayor 2003: 72). Yet Dwyer (1993: 111) can still affirm the belief that 'we' can survive heart attack, while being less certain about our prospects with cancer. Cardiologists who have investigated the outcomes for those who have had a myocardial infarction are less sanguine. Melville et al, after one such review, found that survival rates were not high and those who did survive needed long-term hospital based care. Two thirds of heart attack survivors were readmitted with symptoms that suggested they had had another myocardial infarction (Melville et al 1999: 230-231). An American cardiac specialist referring to a certain degree of failure in medical investigation and treatment of heart disease, discusses it with a pedestrian image and with a levity that would be unthinkable in the case of cancer; "The magic Drano for clearing out the arteries was not discovered" (Kattus 1987: XV).

Not only does coronary heart disease remain a disease with higher mortality than many relatively commonly occurring cancers, its causes are not as well understood as much biomedical and public policy rhetoric would have us believe. Despite well-documented falls in incidence since the late 1960s (Australian Institute of Health and Welfare 2002), coronary heart disease remains a disease of high prevalence and high morbidity. The fall in the incidence due to coronary heart disease in many 'Western' nations since the late 1960s is

attributed to a decline in risk factors distributed among the population, as well as better medical treatment (Australian Institute of Health and Welfare 2001: 18). This fall in risk factors has also been observed in other 'Western' nations that have also witnessed declines in the rates of coronary heart disease comparable to that experienced in Australia (Hetzel and McMichael 1987: 87-90). Certainly some of the factors nominated as risks for coronary heart disease have shown a decline. For instance, the number of people in Australia aged 25-64 years with hypertension has declined since 1980 and overall levels of smoking have declined since the 1970s, while serum cholesterol among men aged 25-64 has declined somewhat since the late 1980s (Australian Institute of Health and Welfare 2001: 26).

However, an unwarranted degree of certainty has been generated about what this change in risk factor prevalence implied in terms of identifying the definitive risks for coronary heart disease. The ostensibly clear and certain knowledge we have about the causes of coronary heart disease comes from population based studies showing an association between certain factors (population averages about smoking, dietary patterns, exercise levels and body weight) and the prevalence of coronary heart disease. However, as Marmot famously pointed out in the mid 1970s, predictions of disease risk among individuals based on risk factors at a population level do not neatly coincide (Marmot 1976). Howell concurs, though wording it differently. In reviewing the role established risk factors may have played in explaining the sharp decline in deaths due to CHD in America since the mid to late 1960s, Howell concludes "However, a significant part of the change cannot be fully explained" (Howell 1993: 97). Tony McMichael, a self confessed defender of the aetiology of the 'big three' (high blood pressure, high plasma cholesterol and cigarette smoking) in causing CHD, nevertheless concludes, "…we are not certain why CHD is on the wane in most Western nations" (McMichael 1989: 5). Although a believer in the role that high serum cholesterol plays in the aetiology of CHD, McMichael nevertheless concludes:

> Despite compelling ecological evidence associating high *per capita* dietary fat intake with high mean levels of plasma cholesterol, epidemiologists were not able to demonstrate this association clearly at the individual level in cross sectional surveys (McMichael 1989: 6).

Similar sentiments are still being reiterated. Australian researchers suggest that coronary heart disease, "…often occurs in people with no major causal risk factors, such as cigarette smoking, elevated blood pressure, high plasma cholesterol…." (Burnett; Watts; Vasikaran 2000). Marmot, another epidemiologist, also cautions against a false reading 'backwards' of

coronary heart disease prevalence rates to identify causes arguing that "…the role of nutrition in causing the rise of ischaemic heart disease can be questioned" (Marmot 1992: 8). The famous 'French paradox' is also yet to be satisfactorily explained. French adults aged between 35 and 64 years living in the south-western part of the country have diets high in fat, yet have low rates of coronary heart disease (Artaud-Wild et al 1993). Likewise, rates of smoking are high among men in Japan (with about two thirds smoking) yet it has one of the lowest rates of CHD of any industrialized country (Marmot 1992: 8-12). Among South Asians living in Britain there is a high level of coronary heart disease despite having lower levels of risk factors (Bhopal and Unwin 1999: 219).

Moreover, all their populations have not equally shared the much-touted decline in the prevalence of CHD in countries like Australia and Britain. Rates have declined most sharply among those in higher socio-economic groups, while rates of decline have been slower, or even static, for those in more disadvantaged socio economic strata (McMichael 1989: 10; Marmot 1992; 15; Australian Institute of Health and Welfare 2000: 44). Socio-economic status continues to be a risk factor for coronary heart disease, independent of the 'big three' risks and other biological factors (McMichael 1989; Australian Institute of Health and Welfare 2000: 44). The confident optimism that the causes and mechanisms of CHD are well understood and that it is a disease amenable to prevention by rational behaviour, that is in making appropriate 'lifestyle changes'. McMichael observed about fifteen years ago that:

> The big three may account for little more than half of the inter-individual variation in CHD risk–although this fraction might increase if the measurement of these factors were more valid and precise (1989: 7).

Thus for all the certainty held out about the risk factors for CHD, they turn out to have very limited predictive value. Even an arch defender of biomedical orthodoxy who is also a scrupulous interpreter of the available evidence about the causes of coronary heart disease concludes:

> This central bulk of the population, with low-to-medium risk scores, accounts for the majority of cases of CHD; the 20 per cent of individuals at highest risk of CHD…account for less than one-half of all CHD cases (McMichael 1989: 7).

The explanation now being proffered to explain this as yet unaccountable variation is depression and or isolation. While in some respects this is a welcome development, shifting attention away from narrow biological factors to more social and ecological ones, it doesn't move away from a rationalist account of coronary heart disease that still distances it from the irrationality and mystery associated with cancer. Depression is a disease category according to biomedical thinking. Though the mechanisms linking depression and CHD are not yet understood, it is suggested that depression may mediate some of the biological risk factors, by rendering individuals more likely to smoke or eat less healthily if suffering from depression (Bunker et al 2003: 272-276). However linking CHD with depression discusses one disease in terms of its causation by another disease: it does not link irrational subjectivity with bodily disorder in the way women are linked to cancer. Linking coronary heart disease with social support makes the link less biological, but ultimately no less rational. The 'cause' of CHD, from the social support hypothesis, links the development of a disease with an external factor in the social environment, not with flawed bodies and psyches, as occurs with women and cancer.

Just as biomedicine overstates its rational understanding of the causes of CHD, its treatment protocols do not always stand up to rational and empirical appraisal. One of the most frequently employed methods of treating Coronary Heart Disease is utilized as much for symbolic and ideological reasons as for those of good clinical practice. Coronary artery bypass graft surgery (CABGS) is a frequently performed surgical procedure in which partially or fully blocked coronary arteries are bypassed with grafts of new arteries, restoring unimpeded blood supply to the heart (Bolton 1991: 25). While it has been demonstrated that CABGS is useful in easing the symptoms of angina, it took 15 years of study to demonstrate this benefit. The procedure had been routinely performed in the absence of substantive evidence that it was an effective, worthwhile procedure (Bolton 1991: 26). Even now, it continues to undertaken for 'palliative' or symptomatic relief, rather than as a life saving procedure (Bolton 1991: 27). In both North America and Australia, it appears to be performed more often on men who are privately insured, despite a higher incidence among men with lower socio-economic status (Bolton 1991: 26).

Biomedical narratives about cancer refer to 'associations' between certain factors and the occurrence of cancer while explaining that the cause is not actually known. However, the rhetoric surrounding coronary heart disease, including that of public policy, confidently refers to having identified the causes of CHD and therefore assumes it can undertake preventive

campaigns. However, most of the epidemiological, clinical and, one might add, sociological, research into coronary heart disease has been conducted on men. As one review in the *British Medical Journal* concluded, "Most research into the causes, prevention, diagnosis, and treatment of coronary heart disease has been conducted in men-more specifically, white middle-aged men" (Khaw 1993: 1145). In particular, taking men as the norm for those who develop CHD may inhibit understanding of the way CHD develops and presents in women (Khaw 1993: 1145). A report by the United States General Accounting Office in the early 1990s found that the US Food and Drug Administration had failed to ensure that drug companies included women in their trials. It noted, in particular, that women were insufficiently represented in evaluations of drugs treating heart disease. In only one of thirteen drugs tested were women included in the trials proportionate to the number of women with CHD. Moreover, in over fifty percent of the drugs trialled the effects on men and women were not analysed separately, leaving the potential for different levels of effectiveness or toxicity unexamined. Even more surprisingly, in almost ninety percent of the drugs investigated, the potential interplay with oral contraceptives was not considered (Anonymous 1992: 11).

While heart disease is stereotypically associated with men, it is a major source of mortality and morbidity for women also (Covello and Peters 2002: 378; Ruston and Clayton 2002: 125). Indeed, mortality due to heart disease is nine times higher for women than deaths due to breast cancer (Covello and Peters 2002: 378). Expressed differently, heart disease accounted for about 30% of deaths among American women in 1998; contrasting sharply with the 4% attributable to breast cancer (Covello and Peters 2002: 389). Similar rates apply in an Australian context (Australian Institute of Health and Welfare 2001). Of the women surveyed in Covello's and Peter's study, sixty percent reported that they feared cancer the most, while less than ten percent nominated heart disease as an ailment they feared (Covello and Peters 2002: 384). Nor is the mis-identification of women's risk of coronary heart disease confined to 'lay' people. In North America too, coronary heart disease is the leading cause of death for women, yet one in three primary care physicians did not know this (Bedinghaus; Leshan and Diehr 2001: 1393). Women with heart disease do not always exhibit the 'classical' symptoms associated with heart disease; that is, those associated with men. Frequently, women present with diffuse and non-specific symptoms of heart disease; these symptoms may not be recognized and diagnosed accurately (Miller 2003). Not only is coronary heart disease less likely to be diagnosed accurately, women are less likely to receive the same forms of treatment given to men when a diagnosis is made. Drug treatment and revascularization techniques are less likely to be provided to women than it is to men in both North America

and England (Bedinghaus; Leshan and Diehr 2001: 1393; Hippisley-Cox et al 2001: 832-837). Women are less likely to be given aspirin therapy or other standard 'cardiac medication', are less likely to receive cardiac catherterization and, even if they have suffered a heart attack, are less likely to undergo cardiac rehabilitation programs (Emslie et al 2001: 224). Hochleitner (2000) also found a gender-based bias in access to specialist cardiology services. Primary care physicians were less likely to refer women with advanced symptoms of coronary heart disease to a cardiologist (Hochleitner 2000: 29-34).

Women are virtually bombarded with campaigns to promote mammography, while awareness and preventive campaigns for CHD are directed overwhelmingly at men (Bedinghaus; Leshan and Diehr 2001: 1393). Even as late as the early 1990s, there was a need to persuade medical and lay audiences alike that coronary heart disease was a problem among women, not just men (Emslie, Hunt and Watt 2001: 223). Perhaps not surprisingly, Bedinghaus et al (2001) report that for women the prevalence of risk factors for coronary heart disease and deaths due to CHD have not fallen, while they have for men. Indeed one-year survival rates after heart attack are lower for women than men (Emslie 2001: 224).

Unlike cancer, which has been presented as both mysterious and threatening, CHD has been depicted as a mechanical ailment, amenable to rational understanding and technological intervention. Yet much of this rational understanding and mastery is more evident in rhetoric than reality. The causes of CHD are not as definitively identified as biomedical rhetoric frequently suggests. Notwithstanding the sophisticated technology used to diagnose and treat coronary heart disease, it remains a disease with high rates of mortality and morbidity. While there is a tendency to suggest that women are at special risk of cancer, there has been, and remains, a tendency to downplay women's risk of coronary heart disease. Chapter six discusses these issues and canvasses some reasons for their existence.

Chapter **6**

Sacred and profane in biomedical cosmology

Diseases…become subjects for decipherment (Susan Sontag 1987).

…diseases are always moral categories…they always carry social meaning…diseases are normative judgements about what is good…(Kevin White 2002).

I return in some ways to my starting point, Sontag's somewhat despairing observation that metaphors make diseases subjects for decipherment; they render diseases vehicles carrying deeper, less visible sets of meanings. The first element in the decipherment of disease metaphors is the model of society they symbolically represent. The writing on cancer analysed in this thesis metaphorically creates a portrait of society that can be deemed the nightmare of liberalism. It is a society populated by some irrational, unregulated individuals that thwart stable social order. By contrast, coronary heart disease's metaphors rely on the symbol of the market to characterize society and define the disease in terms of disrupted supply and demand.

Both these metaphors of society have embedded within them normative assumptions about what constitutes a 'good' body. Assumptions about the good body in turn imply a set of judgements about the characteristics of agency that either threaten or sustain social order. The characteristics of agency that are either a danger to or source of order turn out to be gendered. This gendered theory of agency is then revealed to be isomorphic with a modernist understanding of nature and culture and the 'correct' relationship between them.

However, as Douglas (1978) asserts, none of these symbolic understandings—of the body, of agency, of gender, or of nature—make sense by themselves. They gain their meaning by their relationship to each other and the way they fit within the wider pattern of the model of society. In addition, these elements of the pattern, to employ Douglas's terminology, are best understood by locating them within the framework of modernist epistemology and knowledge. Locating them within this framework provides a way of understanding why metaphors associated with cancer are couched in concepts emphasizing threat and danger, while those linked to CHD are less threatening and more profane in character.

This chapter outlines the metaphor of society highlighted in biomedical accounts of both cancer and coronary heart disease. It then identifies the assumptions about the body, agency, gender and social order in each of these metaphors of society. Finally, it locates the premises of both of these models of society within the framework of the epistemology and knowledge of modernity.

CANCER AND THE 'STATE OF NATURE'

The body envisaged in biomedical accounts of cancer articulates the theme of social differentiation based on the division of labour and the social order it generates. The body

unaffected by cancer is comprised of highly differentiated individuals, who combine to produce complex structures of increasing complexity, existing in a hierarchical order. What emerges is a highly functional productive system based on an extensive and sophisticated division of labour. In the non-cancerous body, cells divide and replicate as ordained and obey the injunction to take up particular identities, as well as the obligations they entail. That is, they behave somewhat mechanically, obeying laws governing their multiplication, their identity and their location. Malignant cells, however, refuse their identity as cells of a given type and reject controls on their replication. They also reject the particular roles that their identity entails, refusing to behave appropriately and disregarding the demands of spatial circumscription. Cancer represents the breakdown of social order through the unwillingness or inability of cells to act in ways that contribute to order and productivity. The account of cancer is centred on the individual cell; systemic order is a secondary aspect of these narratives, featuring only to the extent that an individual unit can harass and threaten an entire order.

Two differently accented accounts of this 'individual' failure are articulated by immunology and molecular biology. Immunology suggests that individual deviance is in some respects 'normal' and inevitable and that a strong systemic level of control is needed to identify deviant behaviour and provide means for its control. Deviant cells are characterized as 'non-self'. The immune system has the function of identifying cells that are non-self and eliminating them. Within this paradigm, a system failure leads to confusion between individuals that are self and non-self. For the sake of order, non-self individuals need to be quickly identified and eliminated, as they are in the body with a properly functioning immune system. Cancer, from this perspective, represents the malevolent activities of a non-self entity that threatens order. Cancer is a failure of recognition and control, leading to the expression of unfettered deviance by non-self individuals.

By contrast, the currently dominant explanation—that of molecular biology—sets out an account of social order being threatened and, ultimately, dissolved by inappropriately socialized individuals. These cells suffer a lack of the internal regulation that is necessary for sociable behaviour on their part. These cells are not 'non-self' as the immunological theory designates them. However, they are different from 'normal' cells in that they are 'primitive' or 'immature', indicating that they are not capable of orderly, civilized behaviour. Rather than obeying proper bodily dictates, they instead seek self-gratification. They do not have the self-discipline to defer their own desire and act in disciplined, orderly and productive ways. If immunology presents a failure of systemic, external regulation, molecular biology outlines an

even more nightmarish scenario of individuals who lack any means or wish to regulate their own behaviour, creating the potential for anarchy.

Despite difference of emphases in immunological and molecular biological accounts of carcinogenesis, both articulate an account of the fragility of order and the threat posed to in by individuals who are not regulated, either externally or internally. In molecular biological accounts, cells behave as if they are in the state of nature. It is the Hobbsian nightmare in which individuals, in their natural state, have inherently selfish desires that, if pursued, undo sociable coexistence and order. Immunological accounts of cancer represent something of the scenario Locke feared in the absence of the regulating force of civil society; if systemic order is flawed and cannot recognize and restrain individuals whose actions are antithetical to the common good and wider order, sociable co-existence would be impossible. Cancer is metaphorically a disease of unregulated individualism. In sum, as depicted by biomedical metaphors, cancer represents fear about the undoing of a social order based on classical liberal theory.

CORONARY HEART DISEASE: THE MARKET FALTERS

The body represented in the well functioning cardiovascular system reflects a view of society as the perfect operation of a market based on unfettered circulation, balancing supply and demand. It is a perfect realization of free market distribution. Blood circulation appears to approximate the action of Adam Smith's 'invisible hand' more closely than any 'real' market does. In a normally functioning cardio-vascular system, the circulation is constant, with supply and demand kept in virtually perfect balance through a range of sensitive feedback loops. If more blood is needed, the heart beats more frequently and it is supplied; if demand is reduced, the heart rate drops and less blood is supplied to cells and tissues. Cells remain the basic productive unit of the body, requiring oxygen and other nutrients (carried in arterial blood); as a result of their productive activity, they also have waste products they must eliminate (carried in venous blood). Like individuals, cells are both recipients of and contributors to the bodily economy, exchanging 'oxygen poor' blood for 'oxygen rich' blood. Exchange is the motif and blood, like money, is the body's currency. However, in accounts of both the cardio-vascular system and of coronary heart disease, cells receive little attention; the focus remains systemic, with attention centring on the cardio-vascular system or on the implications for the body as a whole of cardiac malfunction.

Coronary heart disease represents a failure of balance of supply and demand with potentially catastrophic consequences. The motif of supply and demand is played out at two levels. At the level of pathophysiology, a blocked pipe or pipes (the coronary arteries) stops the effective operation of a pump (the heart itself). The blocked pipe means that the pump itself is not supplied with the blood it needs to keep functioning. This means in turn that the supply of blood to organs, tissues and cells cannot match their demand for it. The impairment or failure of circulation because of CHD is a dramatic event with potentially deadly consequences if not treated speedily and effectively. The second level at which the notion of imbalance between supply and demand is played out is at the level of the 'lifestyle' of the person affected. The human body is a machine that requires a balance between input of fuel (food supplied) and the exercise that consumes it (demand for fuel / food). If too much food of the wrong kind is supplied relative to the demands of the body, the body will malfunction by developing coronary heart disease.

However, despite the gravity of the danger CHD poses, not only to circulation but also to the life of the entire body, the threat is offset somewhat by the 'fact' that the affliction is well understood and therefore amenable to both prevention and effective treatment. Coronary heart disease is portrayed as a consequence of a blocked pipe; it is a mechanical obstruction that is, at the level of rhetoric at least, easily cleared, restoring circulation and re-establishing a balance between supply and demand.

The analogy of body and society contains a number of more deeply embedded and less visible assumptions about the elements that constitute society, as well as presumptions about the correct the correct relationships that should obtain between these elements. However, the metaphorical statements of society and social order encoded in biomedical knowledge about cancer and coronary heart disease emphasize different elements of social order and outline differing relationships between them. I will now briefly sketch the way the metaphors associated with cancer and coronary heart disease state the relationship between these elements of social order.

THE BODY AS A MACHINE

The body depicted in biomedical knowledge of cancer is not a mechanical one. The body, conceptualised as a machine, envisages it as brute, insensible nature obeying impartial and immutable laws. The body not afflicted by cancer does have laws governing cell activity, including their division and replication, their contribution to the bodily division of labour and

their location within the body. However, the presence of cancer reveals how contingent these bodily laws are and how easily they can be disregarded. In the 'cancerous body', malignant cells reject the laws of the body. Malignant cells have their own motivations and intentions- put simply, they exercise agency. They 'rebel', 'infiltrate' and 'colonize', deliberately rejecting the dictates of a normally functioning body. This body is not the body promulgated by Descartes; an insensible element that is merely part of a wider mechanized nature. It is not a Cartesian body that obeys laws of anatomy, physiology, biochemistry and the like. Indeed, the salient feature of malignant cells is that they disobey the dictates that should govern their behaviour and they spurn order. Cancerous cells not only exhibit agency, they engage in agency that is rebellious and destructive. Rather than obeying laws, they obey their own selfish desires.

By contrast, coronary heart disease represents the apotheosis of the mechanical Cartesian body. Coronary heart disease is an outcome of the blockage of a pipe leading to the malfunction of a pump. This however is a mechanical process, devoid of agency; atheroma plaques accumulate and block the coronary arteries. However the blockage however is not the consequence of a decision of the plaque, much less the coronary arteries. It is entirely mechanical action. It does not constitute rebellion on the part of any bodily part or process. Indeed, the accumulation of atheroma represents a normal physiological response to certain conditions, principally high fat diets and cigarette smoking.

The heart and cardio-vascular system operate according to objective laws that apply to the entire natural universe. The heart and the cardio-vascular system are frequently depicted and are explicitly described as an elaborate plumbing system; a metaphor that could hardly be more pedestrian. This body may be impressive because of the finely tuned mechanisms that make up its operation, but it is in the end mere mechanism. The laws of physics apply to blood flow through veins and arteries as much as they apply to fluid flowing through any machines with pipes. The cardio-vascular machine may be brilliant in its design and finely tuned operation, but it is a machine. The heart pumps in response to purely mechanical stimuli: it cannot decide by mere fiat to pump more or less. The heart exercises no agency in its tireless promotion of circulation. If the body needs more or less blood supplied to tissues the action of the sympathetic and parasympathetic nervous system regulates the electrical conduction of the heart to beat more or less rapidly. Vessels in the circulatory system also act in a purely mechanistic fashion, widening or narrowing in response to chemical stimuli as a way of balancing supply and demand for blood flow. As portrayed in biomedical literature, the body envisaged in narratives of coronary heart disease is a Cartesian body *par excellence*.

It is the realization of the Cartesian view of nature as inert and insensible matter, obeying only impersonal, objective laws.

THE BODY AND DISENCHANTMENT

One of the defining features of modernity is its alleged disenchantment. The rationalist and empiricist knowledge of modernity has robbed us of mystery: within a modernist framework all things are capable of rational explanation. Weber's famous definition of disenchantment is worth citing:

> …it means that principally there are no mysterious incalculable forces that come into play, but rather that one can, in principle, master all things by calculation (Weber 1970: 139).

The model of the body articulated in biomedical narratives about cancer is, however, neither mechanical nor disenchanted. It is an opaque body; it has hidden potential that is not only mysterious, it is threatening and anarchic. The mechanical laws that govern the orderly function of the body of coronary heart disease and that can be mathematically modelled and empirically demonstrated do not hold sway in the body afflicted with cancer. This body has hidden workings that cannot be scrutinized-it is less amenable to rational understanding and therefore control. Its operation and its productivity are not secure and predictable. The cancerous body is not subject to calculation and quantification; 'we' exercise less control and power over this body than we do over that conceptualised in coronary heart disease. Rationality has limited ability to decipher and depict this body and technology only limited effectiveness in restoring it to normal function. As the case studies cited in Chapter four indicate, cancer is subtly yet powerfully presented as a mystery. Either the 'victim' is atypical, suggesting that the epidemiology of cancer cannot be rationally predicted, or the cancer used as the case study is one whose aetiology is unknown, which is equally suggestive of mystery.

Moreover, it is not just that cancer is a disease not as clearly understood as coronary heart disease, it implicates the cell and much of the writing on this topic has a quasi-mystical, reverential dimension to it. The cell is the most fundamental element in the body's structure and is the foundation of life itself. Cells have inchoate and protean qualities attributed to them, invoking musings about the foundation and essence of life, and its ultimate purpose, encapsulated in speculation about the place of cancer in evolution. Much writing about cancer has an overtly teleological framework. The biomedical writing about the cell has a quasi-mystical and explicitly awe-struck aura that comparable writing on the heart and cardio-

vascular system lacks. Such 'grandiose', transcendent themes are rarely evinced in biomedical discussion of coronary heart disease. Indeed, one could almost reverse Weber's words to describe the body of cancer:

> …it means that principally there **are** mysterious incalculable forces that come into play… that one **cannot**, in principle, master all things by calculation.

However, the body of coronary heart disease is, in Weber's sense, a disenchanted body (1970:139). Though we may not understand every minute detail of its functioning (as the existence of specialist cardiology journals indicates), 'we' accept in principle that it is completely knowable. Weber's comments on disenchantment could well have been written about the contemporary understanding of cardiac and cardio-vascular function. The structure and function of the cardio-vascular system is putatively well understood. We know the structure of the heart in minute detail; we know and can mathematically model so much of its operation. When someone is afflicted with coronary heart disease, it is not only capable of being rationally explained, it can be visually demonstrated. Moreover, we are confident that we can explain why this complaint has developed. There is almost nothing mysterious or incalculable about this ailment.

Given this true, precise and empirically verified knowledge, the body of coronary heart disease holds few mysteries for 'us'. The causes of CHD are understood, the mechanisms by which the disease develops and impairs cardio-vascular function are well plotted and demonstrated and, on the basis of this sound understanding and armed with sophisticated technology, effective treatment is available. There may be current uncertainty about some of its workings, for example the most efficacious forms of drug therapy, but these will be eroded by the advancement of scientific knowledge. The biomedical knowledge concerning coronary heart disease is a demonstration that the knowledge base of modernity frees us from superstition and error, making the world (including that of our bodies) less mysterious and, therefore, less unpredictable and less capricious.

THE BODY AND AGENCY

In the biomedical narratives about cancer, it is frequently the cancerous body that is depicted as having and exercising agency, rather than the embodied actor. In cancer, cells have their own impulses and desires and act in accordance with them, even though their agency is harmful to bodily order and to the embodied actor in question. It is cells that are 'selfish',

'contemptuous', 'delinquent' and 'destructive'. Cells have motives and act in alignment with them, despite bodily 'laws' that ordain otherwise. Malignant cells reject regulation in favour of self-expression; it is presented as their choice and their action. When the body acts in this fashion, it diminishes the capacity of the actor to exercise autonomous agency, since they are at the mercy bodily impulses beyond rational control.

One way in which biomedicine has attempted to explain this irrational rebellion on the part of malignant cells is to tie them to impulses residing in the psyche of the affected person. As Chapter four demonstrated, the link between the psychology of the person and the development of cancer finds some sustenance in biomedical thought. Cells, in some strange way that it is not rationally understood or empirically demonstrated, respond to the psychology of their 'owner', developing cancer as a response to stresses and strains in their psyche. However this link between psyche and soma means that the actor exercises less agency than in instances where the mind-body distinction is impermeable. Where the mind-body distinction is regarded as less than rigidly complete it indicates that the body may exercise its own prerogatives, in some instances over and against those of 'rational' agency. Such bodies do not represent the famous Cartesian clockwork model of the body, operating on the basis of pure mechanism. They may at any time exercise their own prerogative for action, whatever the wishes or desires of the actor 'in' that body or of the social context in which that actor exists.

However, in the body depicted in coronary heart disease narratives, the mental states of people exert no influence over the operation of the heart or over the development of coronary heart disease. To the extent that stress is considered a factor in the development of coronary heart disease, it is regarded in orthodox biomedical thought as being mediated by purely physical factors, such as increased blood pressure. The concept of stress has in effect been rendered a mechanical process.[1] Descartes famous metaphor of the clock captures the workings of the cardio-vascular system; it operates completely uninfluenced by factors other than its own mechanisms. However, not only is the body envisaged in coronary heart disease narratives uninfluenced by the psycho-emotional state of its owner, this body itself lacks agency. The body modelled in biomedical knowledge of coronary heart disease is brute,

[1] Stress has figured in some accounts of the development and onset of CHD. It figured notably in the Type A, Type B behaviour pattern theory (see Helman 1987). It is enjoying something of a renaissance in relation to links between CHD and depression and / or the concept of social support. However, biomedical orthodoxy and public policy concerning coronary heart disease remain firmly fixated on the physiological mechanisms of stress, notably its effects on behaviours related to smoking and diet and its effects on blood pressure. Stress in understood in mechanistic terms. It is caused by the demands of modern life and is translated into physiological states; there is little that is mysterious or inexplicable about stress.

insensible nature, operating in accordance with preordained laws. It therefore does not exercise agency. Instead, the actor exercises agency precisely because his mind and body are separate.[2]

From being a monarch, dispensing warmth and wealth to its kingdom, the 'modern' heart is a disenchanted pump. Because the body of CHD is so mechanical and functions on the basis of objective, mechanistic dictums, it facilitates the agency of the agent who 'owns and operates it'. Agency, intention and purpose reside in the mind of the disembodied actor who merely inhabits the body and uses it as an instrument of his purposes. Because the body is mechanical and 'objective' it allows those who inhabit it to exercise fully rational agency, freed the dictates of bodily impulses, instincts and passions. Indeed, it is this freedom from the demands of bodies with their own appetites and imperatives that constitutes one of the defining features of rational agency.

A GENDERED THEORY OF RATIONAL AGENCY

The issue of whether the body exercises agency turns out to encode a deeper issue about the nature and exercise of rational agency. This in turn pivots on a gendered understanding of the body and of rational agency. The body of cancer is a body that is not fully mechanized and is therefore not fully disenchanted. It is precisely the qualities of being less than fully mechanical and less than completely disenchanted that render the body of cancer a fundamentally mysterious and irrational one. It is because of this mystery and propensity for irrationality that it exercises agency, sometime over and against the rational mind of the actor. Only fully mechanical bodies maintain a sharp separation between the operation of the mind and that of the body. It is this cleavage between psyche and soma that is the predicate for rational agency. The metaphors associated with cancer and coronary heart disease demonstrate that this association between mechanized bodies, minds uninfluenced by bodily impulses and between agents acting rationally is profoundly gendered.

Given that the body associated with cancer is not mechanical and does not uphold a strict mind body distinction, it is not surprising to find that cancer is stereotypically linked to women. This link is made in two ways. Firstly, both historically and contemporaneously, women remain the focus of biomedicine's attention to cancer. Women have always been perceived by the medical 'gaze', to use Foucault's (1973) terminology, as being at special risk of developing cancer. Breast cancer, in particular, has been the object of sustained medical

[2] The pronoun 'his' is used deliberately since the agent depicted in this narrative is stereotypically male.

scrutiny in a way that no other organ has, despite the fact that other organs have been recognized in biomedical history as common and enduring sites for the development of cancer. For over 2,000 years of 'Western' medical history, women have been portrayed as being at particular risk of developing cancer.[3] In relation to cancer, women have been the object of medical scrutiny, speculation, research and intervention for over two millennia. Contemporaneously, women remain the targets of health promotion campaigns focused on their breasts and cervixes. Breast cancer remains a topic of special attention by medicine, generating specialist research institutes, awareness campaigns and spawning books on the topic.

The second way in which cancer is linked to women is the supposed connection between women's flawed subjectivity, their irrational, anarchic bodies and the development of cancer. The influence of psycho-emotional states on the development of breast cancer or its recurrence is frequently investigated. Comparable studies on the influence of men's psyches on the development of testicular and prostatic cancer are comparatively rare. Even while many of the studies investigating connections between women's psyches and breast cancer find no such association, the fact that the research is even undertaken suggests that sexist assumptions about the mind body relationship in women continue to be made. The language and concepts around cancer have an affinity with a certain long standing and subtle mode of conceptualising women as undisciplined, as irrational and as threatening to order based on rational agency. Indeed, it is the anarchic potential of their bodies that renders women incapable of the rationality that generates and sustains social order. The focus on breasts and to a lesser extent on other reproductive organs, notably the cervix and uterus, reflects and reinforces long-standing associations between women, their anarchic bodies, their supposed affinity with 'nature' and their 'natural' irrationality. Women's diminished rationality has long been linked to their supposed inability to transcend the instincts and impulses of their bodies. Cancer is both reflection and apotheosis of this association. While men do get cancer of their reproductive organs they do not do so because these organs have instinctive drives in a way that breasts, in particular, have. The mystery and irrationality of cancer's causes finds a resonance with the mystery and irrationality of women's bodies within biomedical writing.

By contrast, men are the archetypal victims of coronary heart disease. Indeed, the occurrence of the disease among women has been under-recognized and under-researched and some evidence suggests that women are less favourably treated for it (Covallo and Peters 2002).

[3] I do not know if this emphasis on women's risk of cancer is held by non-Western 'medical' traditions. Research on this topic would be interesting and illuminating, but is beyond the scope of this thesis.

While the development of cancer in women is covertly linked to their irrationality, the onset of CHD among men is clearly linked to their rational and productive activity. Put simply, in orthodox biomedical thought, men develop coronary heart disease as a consequence of working too hard in instrumental public sphere activity; indeed the existence of the disease is taken as a kind of badge of this behaviour. They, like their hearts, have worked tirelessly, reliably and productively, but have not had sufficient care taken of them. Their work places them under stress leaving little time for exercise and encouraging them to smoke and drink more alcohol than is good for them, thus increasing their blood pressure. In addition, wives and children make demands on them and fail to care appropriately for their providers by providing them with the correct kinds of food in the correct quantities. Given this scenario of constant demand and improper care, it is hardly surprising that men's bodies begin to malfunction. Men who develop CHD do not do so because their body has acted irrationally, following its own impulses and desires. They develop coronary heart disease, according to biomedical orthodoxy, precisely because they have exercised rational agency. Furthermore, despite the linking of stress and coronary heart disease, the way stress is stereotypically defined (men working too hard and consequently not taking enough care of themselves) renders something in the external social environment, not as a characteristic of men's psyches. Hence, the link made between women's innate psychological characteristics and their 'risky' bodies is not sustained in the case of men's psyches and the onset of coronary heart disease.

It is also a quintessentially male disease in that it is rationally explicable and mechanical. The ultimate causes of coronary heart disease are apparently well understood: they lie in men's lifestyles. A range of epidemiological studies ostensibly offers empirical verification of this cause and effect sequence. Moreover, the mechanisms of the disease are also ostensibly well understood and empirically verified. There is no fundamental mystery about coronary heart disease in the way there is for cancer. There may be elements of cardiac function that are not yet fully understood. There may also be uncertainty about why particular socio-economic groups are more at risk than others. Yet this uncertainty is regarded as a gap in knowledge ready to be filled, not as a fundamental mystery about the disease, nor as a mystery about the nature of life itself in the way cancer is regarded.

NATURE CULTURE DUALISM RE-EXPRESSED

The body of cancer has important parallels with pre-17th Century understandings of nature. In these traditions, nature is unpredictable and can wreak havoc on civilized order. From this point of view, nature is essentially cryptic, operating from its own little understood and not

easily predictable premises and initiatives. It can be is a force of chaos, or, to use Bacon's misogynist phrase, 'a common harlot', seeking her own satisfaction and refusing (again invoking Bacon's terminology) to give up her secrets (Merchant 1990). In pre-modern thinking, nature has agency. The intellectual revolution of the 17th Century thinking however recast nature from a living entity that could act on its own behalf to being an inert phenomenon that could be acted upon. The body of cancer, like pre-17th Century understandings of nature, acts rather than being acted upon; it is not an inert, mechanical entity subject to the rule of rational agency. In the same way that nature, according to pre-modern sensibility, could erupt and cause havoc with civilized order, so too can the body envisaged in narratives of cancer.

The body envisaged in biomedical knowledge about CHD is obviously part of the domain designated 'nature'. However, it is far closer to the post-17th Century and post scientific revolution understanding of nature as inert mechanical order than the body depicted in 'cancer narratives'. Both the disease of CHD and the body in which it is located are mechanical. They are entities that obey 'objective' laws that are rationally explicable, empirically verifiable and that technology can control effectively. Thus while the model of the body articulated in biomedical accounts of coronary heart disease is 'natural', it is the 'version' of nature that is subordinate to the power of reason, expressed in culture.

Table 6.1: Cancer, coronary heart disease and modernist dualisms

Cancer implies	Coronary heart disease implies
A non mechanized body	A mechanized body
A non disenchanted body	A disenchanted body
Mind and body are not distinct	Mind and body are distinct
The body exercising agency	The mind exercising agency
Women	Men
Nature	Culture

CANCER AND THE LIMITS OF MODERNITY

The body envisaged in biomedical narratives of cancer is not a mechanical body. This undermines a fundamental tenet of biomedicine. The mechanical model of the body—implying the separation of mind and body—has served 'us' very well in certain respects and underpins some of biomedicine's most spectacular and well publicized triumphs, such as cardiac surgery and organ transplants. Yet cancer hints at the unsettling possibility that the body is not a machine and if it is not then, in the biomedical paradigm, it is by definition mysterious and biomedicine has limited power to understand its workings and intervene in them effectively. Biomedicine is a primary bearer of modernist rationality and technological triumph and cancer thus implies its limitations, if not its failure.

Moreover, the way cancer is presented in biomedical tales suggests that the universe itself is not subject to rational laws and rational control. A-typical victims develop cancer. Rather than indicating that the universe is predictable and therefore controllable, these a-typical 'cases' imply the existence of mysterious forces at work. How can the development of breast cancer of a woman in her twenties be rationally explained? (Richards 1972). Case studies like these invite unscientific notions like 'fate' and 'fiat' into discourse on cancer. Moreover, in stressing the mystery of cancer, a sense of rational agency is diminished. If cancer is so mysterious and therefore unpredictable, how can its occurrence be prevented? What rational action can forestall the occurrence of a disease presented as arcane in its origins and random in its distribution?

The modernist sense of rational, autonomous agency is itself partially denied by cancer. The body, that should be capable of control by the agency of the rational mind, turns out to be capable of exercising its own prerogatives. This body therefore has an affinity with an understanding of nature that casts it as also unpredictable and capable of wreaking havoc on order. It thus brings into question the modernist project of control and mastery of the natural world. Rationality and technology have limits, cancer suggests.

As presented in biomedical accounts, cancer also calls into question some fundamental presumptions in modernist epistemology. 'Seeing is believing' according to this epistemology (Daly and McDonald 1997). However, cancer calls into question the extent of this vision. While cardiac dysfunction can be visually demonstrated through various kinds of imaging technology, there is almost no way to 'see into' the body of cancer. Do I have malignant cells in my body as I write this? I do not know and there is no technology that will tell me. I cannot see into my body in this fashion, nor can biomedicine. Even after surgery to remove malignant tumours, there is no way to know if stray malignant cells remain. The body of cancer remains opaque to visual scrutiny.

Does cancer suggest that the deceptive 'Evil Genius' that so haunted Rene Descartes also haunt us? Rational knowledge and effective technology promised to deliver a world that could be disenchanted and therefore controlled. Cancer suggests that this project may not be realized, it implies that we may have been deceived by the promises of modernity.

CHD AND THE TRIUMPH OF MODERNITY

The model of the body affirmed in biomedical accounts of CHD is a machine. It is disenchanted. It holds no mystery and can be mastered. This is not a body that responds to quasi-metaphysical entities such as humours. It is a machine, composed of parts. Biomedicine understands how these parts work and can repair or replace them if necessary. The body represented in biomedical knowledge of coronary heart disease upholds the truth and effectiveness of biomedical knowledge itself. Biomedicine has achieved mastery over this body through rational knowledge. Thus affirmations of ongoing and increasing progress have some plausibility.

In addition, the accounts of coronary heart disease affirm that the world is a rational order, in which verifiable cause-effect laws operate. Biomedicine confidently proclaims that if an individual adopts a certain diet, stops smoking, has a moderate alcohol intake and engages in sufficient exercise, they can prevent CHD. This not only affirms the fundamental rationality and therefore predictability of life, it upholds and reinforces a view of rational, autonomous agency. Individuals can control their body and therefore their life. Unsettling issues of 'fate' do not intrude into the issue of CHD. Rather, as good modern subjects, we ordain our fates. Minds, by choosing certain diets, by deciding not to smoke and to exercise, can control bodies. Cartesian dualism and the theory of rational agency it shores up are affirmed by biomedical discourse on coronary heart disease.

The body depicted in biomedical knowledge of coronary heart disease is also the epitome of other important aspects of knowledge in post seventeenth century cosmology. If mathematics is the language of precise, objective and certain knowledge, as key 17th Century thinkers asserted, knowledge of the cardio-vascular system and, by implication, heart disease represents that knowledge in action. Cardiac output, the amount of blood sent into circulation every minute, can be quantified according to an invariant formula. Even the amount of blood supplied to cells can be precisely calculated using the formula to devise 'cardiac index'. The cardiac cycle, that is the various components involved in the complex process of a heartbeat, is also quantified with the precise time for each element of the process known and repeated *ad nauseam* in texts on the heart and its malfunction. The dream of Descartes, Bacon and their contemporaries to find secure, objective knowledge, described in the language of mathematics, free from the distorting influence of subjectivity, appears to have been realized in the knowledge of coronary heart disease. This is knowledge that is pristine in its precision, solid in its objectivity and immutable in its certainty since it is formulated in a language and

vocabulary ostensibly free of the influence of history and culture. It is the realization of the modernist dream of precise and certain knowledge allowing quantification, prediction and control.

Knowledge of the cardio-vascular system and of coronary heart disease apparently confirms another tenet of modernity's emphasis on positivism, that seeing is believing. Positivism holds that 'true' knowledge comes from empirical observation unimpeded by theoretical or value preconceptions. Visual demonstration of the heart's action and the flow of the blood's circulation is enacted daily in cardio-vascular clinics around the world. The theory of the cardio-vascular system and the existence of coronary heart disease are literally seen in action everyday. This visual drama is 'proof' of the veracity, the certainty and the objectivity of biomedical knowledge. These visual enactments appear to realize another of modernity's dreams; unmediated access to the working of nature and its laws. For the lay public, excluded from cardio-vascular clinics, populist journals and the plethora of television documentaries that find their way into household living rooms offer the same glimpse of biomedical science giving us unmediated vision of nature 'at work' and yielding understanding of the obscure laws governing that work. From the comfort of armchairs we see nature revealed and share the truth of biomedical knowledge.

Thus as depicted within biomedical discourse, cancer and CHD stand in differing relationship to key elements of modernist cosmology:

Table 6.2: Modernist cosmology in relation to coronary heart disease and cancer

Assumption/Value	Coronary Heart Disease	Cancer
Mechanical bodies	Affirmed	Threatened
Rational, transparent individuals	Affirmed	Threatened
Rational agency	Affirmed	Threatened or suspect
Mind-body dualism	Affirmed	Threatened
Nature controlled and regulated	Affirmed	Threatened
Reason	Affirmed (causes and mechanism of CHD are understood)	Threatened (causes and mechanisms of cancer are not well understood)
Technology	Affirmed (CHD treated effectively)	Threatened (cancer always not treated effectively)
Proof of modernist rationality and technology	Affirmed	Threatened
Sign of progress	Affirmed	Threatened

Cancer and coronary heart disease metaphorically emphasize different features of society and social order, as well as what is perceived as their bases and what constitutes threats to them.

What is the sociological significance of these different metaphors? What do they reveal about the relationship between the cosmology of modernity and contemporary biomedical knowledge and its influence? What light can Durkheim's theory of religion, particularly the distinction between sacred and profane, shed on these questions? I address these questions in Chapter seven.

Chapter 7

The elementary forms of the medical life

Biomedicine in particular… presents an ideal of life beyond the ravages of time – beyond death. Are we not back into the supernatural camp which science aspired to leave? Is not our attachment to the scientific viewpoint also connected to our ideal vision of ourselves and our spiritual need to believe in an absolute truth, understood from an absolute, universal position …not unlike that in many religions? …This desire is probably much too fundamental to human life to ever be eliminated. The paradox of modernity is that the search goes on even when denied. (Deborah Gordon 1988).

Medicine is a moral enterprise and therefore inevitably gives content to good and evil. In every society, medicine, like law and religion, defines what is normal, proper or desirable (Ivan Illich 1976).

THE WHY, HOW AND WHAT OF THIS RESEARCH

The starting point for this thesis was the observation, famously documented by Sontag (1987), that diseases have meanings, other than biomedical knowledge about their causes and mechanisms. The meanings with which diseases are attributed are created through metaphors associated with them. For Sontag, these metaphors distort the true (that is biomedical) meaning of disease. This position depends on conceptualising biomedical knowledge as non-metaphorical, that is, as objective and value free; a position at odds with an important vein of scholarship in the sociology of health and illness in the last two decades. My 'hunch', or hypothesis to use more formal language, informed by much of the recent literature on the sociology of medical knowledge, was that biomedical knowledge was implicated in the generation of the metaphors deprecated by Sontag.

Little substantive work has been undertaken within the sociology of health and illness on the place of metaphor in biomedical conceptualisation of the disease. This is a surprising and serious omission, given the contribution understanding disease metaphors can make to sociological understanding of disease and to public health responses to them. The paucity of sociological literature, or even that written within an anthropological vein, limited the scope for a conventional literature review. Therefore I considered why this topic is something of a lacuna in the sociology of health and illness by reviewing approaches to biomedical knowledge within the sub-discipline's dominant schools of thought. Scholarship within a Marxist tradition didn't offer a framework for examining the role of metaphor in biomedical thought because, ultimately, it accepts the epistemological status of biomedicine as defined by biomedicine. Approaches deriving from interpretive or phenomenological premises have difficulty explaining disease metaphors of the kind identified by Sontag (1987) because they, too, leave the 'truth' of biomedical knowledge unexamined. In addition, because they cannot adequately account for culture as a 'structural' entity that is external to individuals, shaping their perception and behavior, they are unable to explore metaphors as 'social facts'. Constructionism does examine the content of biomedical knowledge, but for the most part it treats culture in such a reductive way that it reduces meaning to mirroring vested interests. Moreover, constructionism follows the wider sociological tradition to regard knowledge, especially technical knowledge like that of biomedicine, as an a-symbolic, instrumental phenomenon.

Thus the starting point for this thesis was to consider whether the biomedical knowledge about both coronary heart disease and cancer was metaphorically constituted. A second issue

for investigation was the significance of the difference in attitude noted by Sontag (1987) to both these disorders. If both diseases were constituted by biomedicine in metaphorical concepts, why should they generate such a difference in attitude to them? Finally, why should the notion of a cell rebelling be obviously recognizable as a metaphor while the notion of the heart as a pump is regarded, as it is in biomedical texts, as statement of literal truth?

With these questions in mind, I undertook a thematic analysis of biomedical writing on cancer and coronary heart disease because these disorders seemed perfect test cases of Sontag's thesis. In Chapter three I examined texts written for medical and other health profession undergraduates students, as well as books written for the general public that explained the causes and mechanisms of cancer and coronary heart disease. In this respect, there was a slight imbalance between the books written to explain cancer and coronary heart disease to the 'lay' public. More books were written to explain cancer than coronary heart disease; possibly because cancer is held by both medics and the general public to be both more complex and more mysterious than coronary heart disease. It may also reflect a more prosaic attitude to CHD than is held about cancer.

I was concerned to understand the basic concepts entailed in the medical knowledge about both these ailments in order to discern whether the knowledge concerning them was metaphorically constituted. I was not trying to understand the variety of interest groups or players involved in formulating biomedical knowledge, or the precise historical conditions in which the concept of a disease entity was formulated, as Figlio did in examining miner's nystagamus (1982) and chlorosis (1985). Nor was I attempting to investigate disputes between rival accounts of a particular ailment as Nicolson and McLaughlin did in the case of multiple sclerosis (1988). I was trying to understand not just the social production of knowledge, but also the role of metaphor in that production and to understand why cancer and CHD appeared to be associated with different metaphors, according them different meanings.

Given this, my intention was to focus not on contentious knowledge, but to examine knowledge that biomedicine itself unproblematically accepted as true and beyond dispute and that is, generally speaking, accepted as true by the 'general public'. Fleck (1979) argues that medical knowledge can be regarded as a series of concentric circles. In the inner most circle, containing the most esoteric knowledge, there is considerable uncertainty and debate over that knowledge. As the circles move outwards, the knowledge contained within them becomes less esoteric and is held to be more certain, generating consensus rather than debate. At the limit of the outer circle, knowledge is held to be 'true' and beyond dispute. This is the knowledge

that is presented in texts for undergraduate students and in tomes written for the lay public. It was this level of knowledge that I wanted to analyse. This is 'true' medical knowledge, presented as a true reflection of the body and of disease, and generally speaking accepted as such by most practitioners and by the public. Texts are, by definition, representative of the knowledge I wanted to interrogate. For this reason I referred to popular accounts of both diseases because they are the uncontentious knowledge of biomedicine, what counts as 'normal science' in Kuhn's (1970) terms.

Put baldly, my conclusion is that biomedical knowledge is constituted by metaphors. Secondly, the difference in attitude to cancer and to coronary heart disease derives from the different metaphors with which they are described and they do express the Durkheimian concept of sacred and profane. Biomedicine, like religion, acts as a cosmology linking heterogenous phenomena within a single conceptual framework, classifying them and establishing relationships between them. In its broadest sense, the framework (cosmology) in which biomedicine locates cancer and coronary heart disease is the knowledge system and epistemology of modernity: that is, within an understanding of both what it is 'we' think we know and the means by which 'we' gain knowledge of it. This knowledge and epistemology also harbours implicit claims about the nature of rational agency, about the relationship of nature and culture and about the basis of social order. Biomedicine also fulfils Durkheim's central claim about religion: that is, that all religions make a distinction between sacred and profane places, persons or things. Cancer is sacred because it is metaphorically construed as a threat to the cosmology of modernity and therefore to the basis of its order. Coronary heart disease by contrast is profane because it apparently confirms that cosmology, affirming our routine and mundane experience of it, and upholding the order on which it is based.

CORE ARGUMENTS

This thesis supports Martin's demonstration in *The Woman in the Body* (1989) that medical thought is framed by metaphors drawn from prevailing forms of social organization and the ideologies associated with them. I go beyond Martin by showing that metaphor is of sociological significance and interest because of the light it sheds on the symbolic and relatively invisible influences on the formation of biomedical knowledge. I thus sustain Temkin's view that metaphors linking technical biological knowledge with images of society help locate:

> ...the organism in the same scheme and thereby give meaning to its existence…(these metaphors) served to co-ordinate the interests of our human life and the science of life (Temkin 1977: 283; my inclusion).

Biomedical knowledge about cancer and coronary heart disease centres on the technical domains of cellular activity and cardiac function but links them with transcendent frameworks that are concerned with the image of knowledge and of society, as well as the things construed as safeguarding and threatening its order. Why should metaphor be a means of making knowledge meaningful? Why should the technical knowledge of biomedicine be located in a transcendent framework? These questions require attention to two issues. The first hinges on the epistemological status of metaphor. The second is the sociological significance of particular metaphors. The epistemological status of metaphor comes down to the question, is it possible to think and therefore have knowledge that is not metaphorically constituted? I side with position of Ortony (1993: 1-16) and Lakoff and Johnson 1980: 3-9) that metaphor is a condition of thought and is therefore an indelible part of knowledge, no matter how esoteric or technical it might be. The idea of a concept that is entirely self-referential is an epistemological impossibility. Any concept, whether it is the cell, the heart or the body, only gains intelligibility by being compared (that is being rendered a metaphor) with something else, no matter how overtly or covertly that comparison is made. Therefore even highly technical, esoteric knowledge requires comparison. The evidence of this thesis suggests that metaphor is intrinsic to thought and therefore to knowledge. As Ortony asserted (1993: 3), technical, instrumental knowledge, such as that of biomedicine, is not exempt from the symbolic practice of metaphor. The discussion of cancer in Chapter four reveals that malignant cells are rendered understandable by being compared with irrational individuals. Conversely, as Chapter five demonstrated, the heart is only understood by metaphorically being rendered a pump.

Temkin's argument that technical knowledge, such as that of biomedicine, is linked via metaphor with a more transcendent framework is one clue to the sociological significance of metaphor (1977: 283). A more sophisticated insight is that metaphor taps into what Taylor (1995), Douglas (1975), and Gordon (1988) deem either foregrounded or backgrounded knowledge or 'tacit assumptions'. Gordon, in particular, suggests that biomedical knowledge rests on a set of 'tacit understandings' (1988: 20) that are non-medical and non-scientific in character. These backgrounded assumptions concern the nature of rationality, the ontological and epistemological status of nature, as well as theories of rationality, agency and gender. This backgrounded knowledge is, in Gordon's words, a 'hidden cultural scaffolding'

supporting the more explicit dimensions of biomedical knowledge (1988:19). Wright and Treacher recognized that in 1982, arguing knowledge will necessarily bear the imprint of the setting in which it is formulated.

It is the consonance of metaphors with these wider concerns that largely determines the visibility, or obviousness, of metaphor. The notion of the heart as a pump, for instance, is congruent with the conceptualisation of the body as a machine: it seems more like literal utterance and literal truth than a metaphor. It does not seem like comparison of like and unlike, in the way cancer's metaphors explicitly involve. Deeming cells 'rebellious', for instance, is incongruous with the notion of the body as a machine; it is clearly a comparison of like and unlike. The depiction of coronary heart disease by biomedical knowledge not only fits the paradigm of the mechanized body, but is resonant with other aspects of modernist daily life. Most of us in the modern 'West' would have had the image of a blocked pipe or faulty pump confirmed by problems with household plumbing or malfunctioning car engines. The treatment of CHD also confirms this mechanistic view of the heart and the body; a component of the machine malfunctions, clean out or replace the blocked pipe and the machine is restored to adequate function. The metaphors associated with coronary heart disease affirm a view of the universe as operating on the basis of a rational cause and effect sequence. We, ostensibly, know the causes of coronary heart disease and understand why it produces the effects it does. It is not a mysterious ailment and it affirms a view that the world is rational, stable and predictable. Moreover, the entire notion of the cardio-vascular system finds other resonances with modernity and is 'seen' routinely in the mundane detail of life. The concept of circulation and of a balance between supply and demand makes intuitive sense because it is powerfully reinforced in daily experience. Money, like blood, flows in and out of lives in a circular fashion, coming in via payment for our labour and going out through consumption. Domestic budgets, along with the national ones politicians solemnly warn us about, require a balance of supply and demand. The vision of the body as a market as depicted in biomedical conceptualisation of the cardio-vascular system and the operation of the market in social life seems to confirm each other as literally true.

The notion of cancer, however, does not fit the mechanized conception of the body. Nor does it fit into the routine, mundane experience of life. The metaphor of cancer is invoked to explain what is dysfunctional, anomalous and threatening; as well as what is held to be deeply repugnant. In the context of the body, cancer undermines the notion that it can be regarded as a machine and that it is part of a natural order that is inert and can be subject to rational manipulation. The association of cancer with 'unruly nature' makes it mysterious

unpredictable—an anomaly in the modernist world-view. Cancer is metaphorically associated with deviant behaviour that is not rationally explicable. Cancer thus is understood to signify a less than completely visible and rationally explicable menace to order. Political scandal may provoke the diagnosis of a cancer in the body politic; widespread sexual abuse in the church invokes similar tropes. It is virtually unthinkable that such sins should be explained by the metaphor of coronary heart disease because of its 'transparency'. Coronary heart disease is visible to rational explanation, it can also be empirically visualized through imaging technology (Daly and McDonald 1997) and is, putatively, visibly amenable to control through various forms of treatment. Cancer is associated metaphorically with things that are perceived as irrational and, therefore, beyond control. It is precisely in comparing things that we know to be, or know that should be, different from one another that presence of metaphor becomes obvious.

Why did this concern with backgrounded knowledge lead me to the domain of religion? Why did I not just examine the way biomedical knowledge tapped into and reflected backgrounded concepts of capitalism in the way Emily Martin (1989) did; especially since I find her work compelling and persuasive? For one thing, I was not convinced that Martin's framework would explain the difference of attitude in biomedical conceptualisation of cancer and CHD. This difference seemed to rest on a profound symbolic structure, implicating a cosmology that divided the world into counterpoised attributes, much in the manner of religion. In a brilliant and somewhat overlooked essay, Comaroff (1982) pointed out that there is a powerful symbolic dimension to healing systems, including that of biomedicine, that gives them social power. Specifically, they deal with the universal reality of suffering (and mortality) and draw on and mobilize a symbolic universe to attempt to explain that suffering and attempt its remediation. The capacity of healing systems to create or depict a symbolic universe in which illness makes sense and can be therapeutically responded to is part of what makes them powerful social institutions (Comaroff 1982: 51). However, as Comaroff argues, this utilization of a symbolic universe is never 'un-ideological' in its application and consequences. Comaroff suggests that this symbolic universe acts as a bastion of ideology but could not be reduced to it: indeed, ideology in part derives its power from the symbolic universe with which it is associated. Marxist perspectives, to the extent that they acknowledge this symbolic universe, could not accord it any autonomy, reducing it instead to a mirror of ideology.

Comaroff's argument also helped crystallize something of my discontent with sociological approaches that regard the social form of modernity as completely unique. In part, this is why

the discipline has overlooked the symbolic and religious dimension of biomedicine. While anthropological literature has pointed out *ad nauseam* that in 'exotic' societies the distinction between healing systems and religious ones are less distinct than the division existing in 'our' society, the willingness to consider biomedicine as a healing system that also acts as a cosmology, as a secular religion, has been held in a kind of abeyance. While this proposition has been acknowledged within the sociology and anthropology of health and illness (White 1991; Turner 1995), it has been virtually unexplored.

Durkheim's *Elementary Forms of the Religious Life* offers a means by which to examine biomedicine as a religious phenomenon, as a cosmology that attempted to explain the world and bring order to it. Durkheim argued that the origins of science were in religion and that they retained strong similarities. Both enterprises, in his view, sought to:

> …translate these realities ('nature, man (sic), society) into an intelligible language… the attempt is made by both to connect things with each other, to establish internal relations between them, to classify them and to systematize them… (Durkheim1965: 477).

This quotation provides a remarkably succinct summary of the analysis of cancer and of coronary heart disease in Chapters four and five. The first point to note is that Durkheim alludes, however unwittingly, to the metaphorical nature of both scientific and religious thought, noting that they seek to 'translate' realities. Metaphor is, in effect, a form of translation implying that we understand one thing by in some way translating it into different conceptual terms. Biomedicine understands the body, for example, by translating it into an understanding of society based on the tenets of liberalism. Cells are metaphorically understood as individual citizens and malignant ones are unregulated individuals, 'allowed' to exercise irrational and anarchic agency. The heart is likewise translated into a pump and the body in which it operates is understood by translating it into a market.

The biomedical knowledge of cancer and coronary heart disease both entail an implicit model of the body, which is a metaphor for aspects of social organization. The body of cancer is a metaphor for a society composed of individuals who perform their allotted tasks in the division of labour and accept the identities and spatial circumscription this entails. These individuals regulate their identity and behaviour, or accept external regulation. The healthy body envisaged in these narratives is a model of classical liberal theory in action. The capacity to labour in their self-interest generates a highly functional and productive social order. Cancer metaphorically represents the nightmare of liberalism, where irrational

individuals reject the regulation necessary for orderly social function. The idea of irrational individuals has important conceptual affinities with the 'old', pre-modern view of nature as irrational, mysterious unpredictable and anarchic. Cancer thus aligns with a concept of nature that has supposedly been superseded.

Given the conceptual similarity between cancer and nature, it is not surprising to find that cancer is symbolically linked to women. This link is made in two ways. Firstly, the language and concepts used to describe and explain cancer have significant similarities to the way women have been and continue to be conceptualized. Women have bodies that are frequently depicted in biomedical thought as irrational, mysterious, unpredictable and anarchic; like both cancer and nature. Women are linked with cancer through what Thompson terms 'metaphoric parallelism', that is, a structural correspondence that is symbolically expressed (Thompson 1993: 137-138). Moreover, throughout the history of 'Western' medicine there has been an inordinate focus on women's sexual and reproductive organs as sites that are particularly susceptible to the development of cancer. Women's supposedly fundamental irrationality also has been and continues to be linked to the onset of cancer because the distinction between psyche and soma is not as impervious as it is assumed to be for men. The link is thus made between cancer, women, irrationality and disorder. Hence the biomedical theory of cancer is like a set of Russian dolls; containing within it a theory about the body, which contains a set of presumptions concerning the attributes of nature and this in turn conceals a theory of agency and gender and their relationship to order.

Likewise, the theory of coronary heart disease outlined in the biomedical literature I examined also contains a theory of the body that is a metaphor of society conceptualized as a market. This is a model of the body, and of society, in which normal function is maintained and guaranteed by the unimpeded circulation of blood in which the heart and cardiovascular system balances the demand for it with supply. The heart is conceptualized as a pump and the cardiovascular system as a plumbing arrangement. While cancer is associated with irrationality, coronary heart disease is, as presented by biomedical literature, a 'rational disease'; its causes and mechanisms are known and it can be effectively treated. It is a mechanical disease; a blocked pipe stops a pump working effectively. This conforms to the modernist idea of nature as an inert and insensible universe, operating from the imperatives of objective laws of matter and motion. This is nature that can be understood, predicted and controlled. It thus affirms a view of culture having sovereignty over nature because of the association of culture and rationality. While cancer covertly depicts the body as acting over

and against the agency of its own, the body affected by CHD is not exercising agency but merely responding to impersonal laws.

It is not surprising that coronary heart disease exhibits 'metaphoric parallelism' with men and the rational order of culture. Culture is rational because it is distinct from the domain nature and exercises control over it. The rationality attributed to men is premised on their distance from their bodies. Men are not subject to the fiat of irrational bodily dictates, as women are presumed to be: men control their bodies rather than being controlled by them. Coronary heart disease is not only the result of rationally explicable causes: it develops because men use their bodies in instrumental and productive activity. This activity can be harmful to their mechanized bodies but it is still activity that is emblematic of rational agency.

The metaphors associated with each disease thus establish the following set of 'metaphoric parallels'.

Table 7.1: Metaphoric parallels of cancer and coronary heart disease

Disease	**Cancer**	**Coronary Heart Disease**
Metaphoric parallels	Nature	Culture
	Irrartionality	Rationality
	Disorder	Order
	Women	Men

The technical knowledge of biomedicine turns out to be set within a broader set of assumptions about the nature of rational agency and therefore in a theory of gender, the relationship between nature and culture and, on these bases, of what constitutes social order or a threat to it. Thus what might appear to be highly circumscribed and a-contextual knowledge about the cell or cardiac function turns out to be embedded in a 'social cosmology'. That is, a theory of the social universe including its constituent elements and the relationships that should obtain between these elements to maintain that universe. The metaphors associated with each disease provide a window onto that cosmology. The 'tacit assumptions' (Gordon 1988: 41) underpinning biomedical knowledge would not have been rendered visible without an analysis of metaphor.

The metaphors associated with cancer and coronary heart disease do reveal a set of counterpoised qualities. This juxtaposition of the attributes associated with cancer and CHD is not piecemeal. They reflect modernist knowledge and epistemology and the things that oppose or support them. Those that contradict the cosmology of modernity are construed as dangerous and threatening. Durkheim's distinction between sacred and profane is one

compelling explanation of this division of the modernist universe into order-creating qualities and those that are regarded as menacing.

This cosmology of biomedicine is religious in that it encodes what Douglas would call a catalogue of dangers, threats and sources of pollution: these things are held to be threatening to the legitimacy and, indeed, the existence of that society and culture. This catalogue also recognizes things that are reassuring, beneficent, and act as sources of order. The cosmology of biomedicine is part of the wider cosmological shift ushered in during the 17th Century. The intellectual and scientific revolution of that epoch ushered in a new epistemological paradigm and a new body of knowledge that purported to be able to explain everything, in principle at least. 'Rationality and 'True Knowledge' were the guiding components of a faith that asserted all things could be known, understood, predicted and controlled (Toulmin 1990). Progress consisted precisely of the expansion and triumph of these intellectual armaments in all fields of human life. Nature could be subdued and harnessed for human purposes. Social order could be secured through the action of rational agents pursuing their ends in ways that built rather than threatened social order. Disputes could be resolved by an appeal to demonstrable 'truth'. Technology, founded on rationality and scientific method, could be utilized to solve all problems. It is the era of progress and triumph (Porter 2000; Shapin 1998; Toulmin 1990). For historians, and indeed sociologists, of Whig sensibility this is the history that the seventeenth century ushered into being (Butterfield 1965). It is among other things a story of disenchantment. All things are in principle knowable and since the 17th Century more things have become known with greater certainty (Weber 1970). The history of medical thinking about and therapeutic response to coronary heart disease appears to exemplify this reading of modernist history. The 'superstition' of regarding the heart as a furnace warming blood was replaced by the 'truth' of the heart as a pump that propels it. This can be visualized using imaging technology, confirming that we can have unmediated and objective vision of nature at work. As Daly and McDonald (1997) argue this is a powerful reinforcement of the epistemological adage that 'seeing is believing'. Not only do we understand the heart, technology can effectively and spectacularly intervene in its pathophysiology. Coronary arteries that are blocked can be unblocked. If necessary, the heart can be replaced with a transplanted one.

What then do we make of the metaphors associated with cancer, suggesting unsolved mystery and the ongoing potential for the eruption of disorder? Why should they exist given the apparent triumph of modernity? One reason is historical. The triumphalist reading of seventeenth century history overlooks the extent to which the intellectual and scientific

achievements of that era were born out of and were a response to crisis and a pervasive fear about the spectre of ongoing disorder. 'Reason', 'truth' and science were as much concrete tools to end dispute and disorder as they were abstract goods valued in themselves (Shapin 1998; Toulmin 1990). Fear of chaos was the sub-text of the seventeenth century's dazzling intellectual and scientific accomplishments (Bordo 1987).

However, the metaphors associated with cancer suggest that the fear that underlay much of the frenetic intellectual and practical activity of the birth of the modernist era persists despite three centuries of breathtaking achievement, if not 'progress'. A Durkheimian perspective suggests that the kind of latent unease that cancer's metaphors express is endemic to human societies. As Douglas says (1975), all cultures have a conceptual universe recognizing sources or order and threat. While these may be conceptualised as 'gods' or natural forces, our culture recognizes rationality as a source of order and identifies things that threaten it. Cancer metaphorically represents the fear of the persistence of irrationality and the fragility of order in its face. It suggests that nature still has the capacity to thwart the sovereignty of culture and that reason may still be captive to irrationality. The model of rationality associated with masculinity, these metaphors warn, can still be subverted by the mysterious attributes stereotypically associated with femininity, should its wilful caprice be exercised. The threats from which the seventeenth century sought to distance itself can still thwart rationality, truth, science and technology, despite their predictive ability and their capacity to master much of the natural and social worlds.

Hence the cosmology of modernity actually implies the division of the universe into a set of qualities or potential states that look remarkably like the qualities usually addressed by 'religion':

Table 7.2: Modernity's religious' division of the world

	Backgrounded (Cancer)	**Foregrounded (Coronary Heart Disease)**
Symbolic classification of Modernist cosmology expressed in cancer and coronary heart disease	Mystery	Mastery
	Capriciousness	Predictability
	Anarchy	Order
	Threat	Security
	Fear	Confidence
	Sacred	Profane

At first blush, it seems strange to deem cancer and the range of threats it symbolically represents as sacred and coronary heart disease as profane. However, Durkheim is clear that sacred things are not, as is often assumed, "…superior in dignity and power to profane things…." (1965: 52). Sacred entities are entities that must be protected and isolated, while

profane phenomena have to be kept at a distance from sacred ones (Durkheim 1965: 56). In Durkheim's words:

> In addition to men (sic), society consecrates things, especially ideas. If a belief is unanimously shared by a people, then…it is forbidden to touch it, that is to say, to deny it or to contest it. Now the prohibition of criticism is an interdiction like the others and proves the presence of something sacred (1965: 244).

Thus, says Durkheim, ideas can be sacred and need to be set apart from profaning influences. The epigraph for this chapter, from Gordon, implies that biomedicine is infused with and is a bearer of a, "…need to believe in an absolute truth, understood from an absolute, universal position…." (1988: 40). What cancer and its metaphor do is suggest that the 'absolute truth' of our culture may be less than absolute. In this instance, Mary Douglas' elaboration of Durkheim's formulation of sacred and profane is especially useful. For Durkheim, the sacred is of course society in action, pressing its own demands and imperatives on its members. However, like any theorist of ideology, Durkheim insists that the real source of this power must be veiled to those who would be subservient to it. What sacred things do, in Douglas' view (1975), is reveal the socially constructed nature of the 'truth'. Sacred things are dangerous from this perspective: they can threaten the authority on which a given social order is based. The metaphors associated with cancer expose the limitations of modernist cosmology and calls its truth into question. Coronary heart disease upholds and apparently affirms these components of modernist cosmology: we sense little threat to the sources of order and authority threat from it. Coronary heart disease and the metaphors it generates confirm the power of rationality, the effectiveness of science, and the triumph of technology. Our culture does thus seem to be founded a set of truths that have an existence beyond history and culture. In this sense, coronary heart disease and its metaphors are profane because it does not threaten to expose those 'truths' as socially constructed. Coronary heart disease does not force us to examine our world-view and the routine activities of life.

Comaroff reminds us that healing systems are not only symbolic systems but are also ideological systems (1982: 49-50). In presenting a model of mechanical bodies and rational agency, in valorizing the mind-body distinction, and in defining and demarcating nature and culture, biomedicine is a profound contributor to existing social structure and relationships. Rather than recite the 'usual' (and justified) charges made against biomedicine—that it 'naturalizes' the social processes of disease causation, that it fragments human experience by

cleaving psyche and soma, and that it shores up capitalist ideology by individualizing disease—I think a different tack to medicine's ideological impact is in order.

Medicine's capacity to symbolically identify sources of threat to 'our' cosmology and therefore social organization, can enrol us in its quest for 'mastery' over those threats. In so doing, it shores up its own institutional power, its own research program and the massive funds associated with them. The religious, or cosmological, dimension of biomedicine is, however, a powerful and autonomous factor in its ideological power. Durkheim recognized this in suggesting that faith in science was not determined by proof of its effectiveness; a less rational imperative is at play; "If a people did not have faith in science, all the scientific demonstrations in the world would be without any influence whatsoever in their minds" (1965: 239). Samuel Broder, one time Director of the American National Cancer Institute, commenting on the twentieth anniversary of America's 1971 'War Against Cancer', confirmed only a 'slight reduction' in overall cancer mortality for those less than 65 years of age and acknowledge 'less progress' for those over this age. Moreover, he conceded that overall survival rates for minority groups were deteriorating. The *Lancet's* report on the anniversary articulates remarkably similar sentiments to those of Durkheim about the power of faith in science. It concluded with an insight into how fear of cancer and faith in science combine to ensure public support for huge investment in cancer research (worth about $9b annually in the US at the beginning of the 1990s):

> At one timed the proponents of the programme feared that the public support would wilt in the absence of clearly visible progress. But, if anything the public has more faith in science than do many scientists themselves. Combine that faith with the universal dread of cancer, and the War on Cancer will generously financed for as long as necessary (Greenberg 1991: 1582-1584).

Australia is part of a multinational event, 'Daffodil Day', that aims to raise funds from the general population for cancer research. The event is sponsored by the Cancer Council of Australia, which spends about $50 million annually on 'cancer control activities' in this country. The 'Daffodil Day' in 2003 was confidently expected to raise about $9.5 million dollars (Cancer Council of Australia 2003). In addition, the Cancer Council of Australia also sponsors 'Australia's Biggest Morning Tea' that raised about $5.8 million in donations from the public in 2002. The 'Relay for 'Life' is another national fund raising initiative, generating funds for research into cancer and support services for people with the disease. Not surprisingly, a national fund raising initiative to raise funds for research into breast cancer is

also sponsored by the Cancer Council of Australia, the 'Pink Ribbon Day' (Cancer Council of Australia 2003). By contrast, 'Heartweek', the promotional and fundraising event sponsored by the Australian Heart Foundation expected to raise a more frugal $2.5 million dollars from the general public's coffers (National Heart Foundation of Australian 2003).

The subject of cancer finds a great resonance in public sensibilities, because it is associated with mystery, as Sontag asserted. However, while Sontag claims that biomedical knowledge will erode that mystery and therefore concomitantly defuse the fear associated with cancer, a Durkheimian perspective suggests that much of the 'fear and loathing' is generated by biomedical knowledge itself. This fear is generated because biomedicine acts as a cosmology that divides its conceptual universe into a set of characteristics that promise order, prediction and control, on the one hand, and those that threaten with disorder, fiat and uncontrollability, on the other. These are religious attributes, in Durkheim's terms, because they are an expression of the distinction of sacred and profane. While coronary heart disease heart disease is a serious illness and a pressing public health problem, it does not generate the pejorative mythology linked to cancer because it is constructed by medicine as expressing non-threatening, profane concepts.

My discussion of Durkheim's concepts of sacred and profane has been couched at a relatively high degree of abstraction, since my intention was merely to examine whether they had utility in analyzing medical knowledge. Likewise, my discussion of their implications has been formulated only in general terms and more detailed empirical examination of their ideological impact would be welcome. The notions of sacred and profane could do with greater theoretical refinement, building on Durkheim's original, and not always clear, formulation of them. I have relied heavily on Mary Douglas' (1975) understanding of what Durkheim's use of sacred meant. Different understandings of sacredness and profanity might yield a different understanding of how and why attitudes to cancer and coronary heart disease are as they are. Furthermore, empirical work in applying them seems called for. Are there diseases of public health importance, such as diabetes or arthritis, that do not align with a dichotomous understanding of sacredness and profanity in biomedical knowledge concerning them? I have also presented a relatively static 'snap-shot' of these ailments that could be augmented by more detailed historical analysis. For instance, does the status of a given disease change over time, becoming transformed from a sacred ailment to one that is profane, or vice versa? Though I have not appeared to champion phenomenological approaches in this thesis, studies examining how sacred and profane are constructed and transmitted in 'routine' situations, such as teaching or clinical work, would also be illuminating. Further work examining in

greater detail the link between biomedicine as a symbolic, secular religion and its ideological consequences would also be very fruitful.

FINAL WORDS

Sociology has not examined the place of symbolism in biomedical knowledge: this task having been undertaken in the main by historians (see in Wright and Treacher 1982), some feminists (Martin 1989) and by some anthropologists (Gordon 1988). In part, this stems from the fact that sociology is a discipline that is universalistic in rhetoric while being relativist in practice. In taking modernist society as its unit of focus, sociology has uncritically accepted that it is a distinctive form of society, which of course it is. However, modernity has been regarded as radically discontinuous from earlier social and cultural forms. Furthermore it has been regarded as radically and essentially different from non-Western forms of society and culture. Modernity as a form of social organization has been viewed through the lens of modernist knowledge and values and this has limited our capacity to understand our own knowledge and its associated values. The assertion of difference, without trying to identify significant similarities, has led, I believe, to a somewhat truncated understanding of biomedicine and I have tried to identify that deficit in this thesis.

This assertion of the distinctive difference of modernist society has been most marked when science or other technical fields of knowledge and endeavour have been the analytical focus. These fields, as Comaroff notes (1982), have been regarded as been largely a-symbolic and having few religious referents. As a secular and instrumental discipline, sociology has viewed modernity through the lens of secularism and instrumental reason. Not surprisingly, therefore, sociology has regarded modernity as an almost completely secular, instrumental and disenchanted social form. This ostensible distinction between modernist disenchanted thought and non-modernist symbolic thinking is captured in Mary Douglas's ironically tinged observation, "Our practices are solidly based on hygiene; theirs are symbolic: we kill germs, they ward off spirits" (Douglas 1988: 32).

By contrast, anthropology, while an ostensibly relativist discipline, is in reality more universalistic in practice than sociology. Anthropology examines diverse cultural contexts while looking for common patterns between them. It is therefore capable of seeing 'universal' aspects of social and cultural life. Ironically, it is this capacity to see universal dimensions of social and cultural life that gives anthropology its greater capacity to acknowledge the symbolic dimension of biomedical knowledge than sociology. Anthropology holds the

promise of being able to question the unique status accorded to, and abrogated by, biomedicine. It is thus not surprising that the major theoretical and empirical referents of this thesis come from anthropology rather than sociology: namely, Durkheim (in his anthropological vein), Mary Douglas, Jean Comaroff and Emily Martin.

However, it is not sufficient to give the field over to anthropology. Many anthropologists, while acknowledging that they analyse the symbolic and religious dimensions of health and illness better than sociology as a discipline does, concede that the latter is more adept at analysis of ideology and political economy (Lock and Scheper-Hughes 1990). A rapprochement of sociology and anthropology is therefore desirable because it would allow these two orientations to inform each other rather than travelling along parallel lines. A greater fusion of anthropological and sociological concerns and orientations would allow Comaroff's agenda of examining the confluence of symbol and ideology to be realized more completely.

Public health would also benefit by a greater attention to the power of symbolism and the religious referents of medicine. Biomedical knowledge is an important component of the diverse set of undertakings subsumed under the rubric of 'Public health'. Thus greater attention to the influences shaping biomedical thought could produce more reflective public health practice. The inordinate focus on women's cancers, for instance, is surely a product of the kind of symbolic classification system identified in this thesis. How far does this set of symbolic associations drive research, particularly into breast cancer? Some might argue that the focus on breast cancer is pragmatic; if mammography can aid early detection of cancer and its more effective treatment, surely it is sensible to advocate it. However, the long-standing focus on women and their breasts in the history of 'Western' medicine suggest that such an argument is a *post facto* rationalization, masking a less visible motive. Moreover, the linking of women's psycho-social states with breast cancer and other ailments could receive more critical scrutiny within public health than it has hitherto received if some of the factors fuelling it were identified. The tendency to define women's bodies as less mechanical than those of men is likely to be one of the reasons that coronary heart disease has been and remains less well treated among women.

Conversely, the tendency to define men's bodies as machines has meant that the psycho-social components of their ailments have been kept conceptually invisible, surely resulting in poorer health outcomes and poorer health services for them. A greater willingness to consider men's bodies as gendered rather than gender neutral and emotion free machines might

encourage a greater awareness of testicular cancer, for example, and aid effective early intervention campaigns. A less fearful and horror stuck attitude to cancer, by contrast, might quell the movement urging men to routinely be screened for cancer of the prostate: a campaign with limited public health benefits and an inordinately high risk of inducing unnecessary suffering for many men.

Less pejorative imagery and less fear about cancer could help shape a more informed debate about public health and public policy responses to it, particularly if some of the bases of such fear were more clearly identified and understood. An awareness of the 'religious' underpinnings of this research would make it easier to ask critical questions of it, because some of its powerful, yet largely invisible, determinants become more clearly understood. Should public health practitioners establish different research agendas and speak out against many of the existing ones? Is a 'war on cancer' the best response we can make to this disease? I suggest not, since it fuels fear of an enemy that, putatively, will be eradicated by more extensive research into cells, chromosomes and genes, whereas a more nuanced understanding of social life and more resolute public policy is likely to produce more advantageous outcomes. By the same token, further research debunking the notion that we clearly understand and effectively treat coronary heart disease would be welcome. For one thing, it might inspire research and policy alternatives to the myopic focus on 'the big three', as McMichael (1989) deems them. Self-congratulatory medicine can be as dangerous as that fuelled by evangelical and zealous attempts to 'discover the truth' and 'find the magic bullet'.

I am not suggesting that medicine needs to be de-bunked, just more completely understood as a social and therefore as a religious enterprise. Biomedicine makes a useful contribution to our individual and corporate life, as does public health. However, the extensive and still growing critique of important aspects of medicine as a discipline indicates a need to re-evaluate some of its important tenets. One of those tenets should be, I submit, what I have identified as its religious intellectual and value underpinnings. My hope is that this thesis makes a contribution to that end.

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Appendix 1

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