

THE DISAPPEARANCE OF THE SICK-MAN FROM MEDICAL COSMOLOGY, 1770-1870.*

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Abstract. The sick-man may be said to have disappeared from medical cosmology in two related senses during the period 1770-1870. Firstly, as control over the means of production of medical knowledge shifted away from the sick towards medical investigators the universe of discourse of medical theory changed from that of an integrated conception of the whole person to that of a network of bonds between microscopical particles. Secondly, as control over the occupational group of medical investigators was centralized in the hands of its senior members the plethora of theories and therapies, which had previously afforded the sick-man the opportunity to negotiate his own treatment, were replaced by a monolithic consensus of opinion imposed from within the community of medical investigators.

Introduction

It is the objective of this paper to analyse the changing structure of relationships which generated and sustained the diverse systems of medical cosmology characteristic of Western European societies during the period 1770-1870. The paper will proceed along the following lines. Firstly, the notion of medical cosmology is introduced, and those aspects of medical cosmologies which are of interest indicated. Secondly, the concept of the mode of production of medical knowledge is defined. Three specific modes are identified and discussed, viz. Bedside Medicine, Hospital Medicine and Laboratory Medicine. Thirdly, the three types of medical cosmology associated with each of the three modes of production of medical knowledge are described. Fourthly, a distinction is drawn between person and object orientated cosmologies in terms of their central organizing concepts. Fifthly, it is suggested that the transition from Bedside Medicine through Hospital Medicine to Laboratory Medicine was accompanied by a shift in cosmological form away from a person orientated towards an object orientated cosmology.

The Concept of Medical Cosmology

Medical cosmologies are basically metaphysical attempts to circumscribe and define systematically the essential nature of the universe of medical discourse as a whole.¹ They are conceptual structures which constitute the frame of reference within which all questions are posed and all answers are offered. Such intellectual gestalt provide those sets of axioms and assumptions which guide the interests,

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perceptions, and cognitive processes of medical investigators. They set out the first principles of problem orientation, explanatory strategy, methodology, and acceptable results which are not so much tested as celebrated in the intellectual activity of their adherents. Medical cosmologies are an indispensable first order of relevance and relation which enable their adherents to make sense of and to act within the world. They provide an overall definition of the field and a preliminary affirmation of its form. Hence cosmologies are not only ways of seeing, but also ways of not seeing. Cosmologies prescribe the visible and the invisible, the imaginable and the inconceivable. They exclude in the same moment as they include.

Cosmologies should not however be conceptualized as static normative frameworks—rather they are ongoing sets of possibilities, not so much states of knowledge (and ignorance) as ways of knowing (and ignoring). It is therefore necessary to examine the process whereby a cosmological vision is generated, sustained, and developed within a specific social group. This will be discussed through an analysis of the concept of the mode of production of medical knowledge, and the specification of three distinct modes of production which successively dominated Western European societies in the period 1770–1870.

It is the thesis of this paper that medical cosmologies may be seen not merely as cultural artefacts, lying outside the realms of social discourse, but as modes of social interaction within the structures of relationships which surround the production of medical knowledge. It is contended that medical cosmologies generate, reflect, and project conceptions of order and identity in the network of relationships which constitute the process of innovation in medical knowledge. They function as a medium within and through which perceptions of self and of others are expressed, legitimized, and institutionalized. In short medical cosmologies are not only statements about the world but are also ways of relating to others in the world.² The notion of cosmology as a mode of interaction will be discussed through an examination of the part played by medical theories in the negotiation of relationships within the three systems of production of medical knowledge identified. The concepts of person and of object orientation of medical cosmologies will be introduced and employed in this analysis.

The Mode of Production of Medical Knowledge

For the purposes of this paper the mode of production of medical knowledge³ will be defined as consisting of the following interrelated elements.

(1) a group or class which controls and mobilizes the means of production of medical knowledge but is not itself directly involved in the labour process—the patron.

(2) a group or class which, with a greater or lesser degree of relative autonomy, undertakes the process of production of medical knowledge by means of the application of its labour power—medical investigators.

(3) a set of relations formed in production which constitute the configuration of

interdependence which bind patrons and medical investigators—a system of patronage.

(4) raw materials of production⁴—in this case perceptions of the essential context within which morbid processes occur and within which explanations and cures must be sought.

(5) the production process itself—the predominant occupational activity of medical investigators—carried out by means of theoretical and empirical techniques expressed within conceptual frameworks which determine the questions posed and the solutions contrived.

(6) a product—a system of theoretical presentations of bodily events.⁵

Using this set of dimensions, three distinct modes of production of medical knowledge will be identified, each of which successively dominated Western Europe in the period under review.⁶ These will be termed Bedside Medicine, Hospital Medicine, and Laboratory Medicine.⁷ A description of these three modes is contained in Diagram 1. Each mode of production was associated with a characteristic system of cosmology. A description of the major features of these cosmologies is contained in Diagram 2. The paper will continue with a discussion of the types of medical cosmology associated with each of these three modes of intellectual production, followed by an examination of the social structures of innovation of which these cosmologies were a part.

Three Types of Cosmology

Bedside Medicine was the mode of production dominant in Western Europe at the beginning of the period covered by this paper. By its very nature Bedside Medicine was polycentric and polymorphous. It is therefore somewhat misleading to cite one or two specific centres of innovation and development as examples. However the leading medical school of the continent in the last third of the 18th century was probably that in and around the University of Edinburgh.⁸ Elsewhere I have described the system of production of medical knowledge prevailing in England during this era.⁹

The vision of the sick-man institutionalized within the tenets of Bedside Medicine was that of a conscious human totality—a viewpoint that transcended, not merely united, the distinctions of psyche and soma found in modern medicine.¹⁰ The two major growth points of Bedside Medicine were phenomenological nosology and speculative pathology.¹¹ Both activities generated a large number of often mutually contradictory theories, and as a result medical knowledge consisted of a chaotic diversity of schools of thought. The definition of the field was diffuse and problematic, disciplinary boundaries weak and amorphous. The fundamental premisses of the subject were a matter of dispute and debate. Rivalry between the proponents of the various theories was commonly conducted at the level of personal abuse and dogmatic polemic.

Within this disarray, however, a common set of cosmological principles may

Diagram 1: Three Modes of Production of Medical Knowledge

	Patron	Occupational Role of Medical Investigator	Source of Patronage	Perception of Sick- man	Occupational Task of Medical Investigator	Conceptualization of Illness
Bedside medicine	Patient	Practitioner	Private fees	Person	Prognosis and therapy	Total psycho- somatic disturbance
Hospital medicine	State; hospital	Clinician	Professional career structure	Case	Diagnosis and classification	Organic lesion
Laboratory medicine	State; academy	Scientist	Scientific career structure	Cell complex	Analysis and explanation	Biochemical process

be discerned. Controversy centred around differing interpretations of the same open ended model of bodily processes. Thus, for example, despite differences in the specific contents of their theories, nosologists constructed their pathological entities according to the same general principle, i.e., by grouping together experientially related symptoms. Hence disease was defined in terms of its external and subjective manifestations rather than its internal and hidden causes. In accordance with this principle diagnosis was founded upon extrapolation from the patient's self report of the course of his illness.

Pathology was speculative, systemic and monistic. Medical investigators

Diagram 2: Medical Cosmologies, 1770–1870.

	Bedside Medicine	Hospital Medicine	Laboratory Medicine
Subject matter of Nosology	Total symptom complex	Internal organic events	Cellular function
Focus of Pathology	Systemic— dyacrisis	Local lesion	Physico-chemical processes
Research Methods	Speculation and inference	Statistically oriented clinical observation	Laboratory experiment according to scientific method
Diagnostic Technique	Qualitative judgement	Physical examination before and after death	Microscopic examination and chemical tests
Therapy	Heroic and extensive	Sceptical (with the exception of surgery)	Nihilistic
Mind/Body Relation	Integrated: psyche and soma seen as part of same system of pathology	Differentiated: Psychiatry a specialized area of clinical studies	Differentiated: Psychology a separate scientific discipline

sought to discover a single basic cure for all the ailments known to man. This was achieved by invoking some universal, ontologically irreducible, first cause of illness. The study of proximate and precipitating causes was neglected in favour of the elucidation of the general underlying predisposition to ill health. These morbid forces were located within the context of the total body system rather than within any particular organ or tissue. Furthermore, in addition to physical disposition, all aspects of emotional and spiritual life were deemed relevant to the understanding of the functions of the constitution. It was also believed that each individual had his own unique pattern of bodily events which the practitioner had to discern in each case. The practitioner was expected to adopt an active therapeutic role, intervening in the pathological processes afflicting his clients through the heavy application of heroic remedies.

Medical cosmologies are frequently expressed in the form of metaphors or analogies, which enable their holders to explain bodily events by treating them as if they were of the same order as other phenomena with which they are already familiar. This foundation of metaphor may become part of the everyday taken-for-granted currency of social exchange, and, in the processes of socialization and interaction, come to be seen as an objective description of the ultimate realities of the medical world.¹² In the era of Bedside Medicine cosmological analogies emphasized an image of the body as a microcosm, a reality *sui generis* subject to its own peculiar laws of growth and decay, comparable to the macrocosm of the physical universe.¹³

A dramatic transformation in the form of medical cosmology occurred at the Parisian hospital schools during the first three or four decades of the 19th century with the introduction of a new mode of production of medical knowledge, here termed Hospital Medicine.¹⁴ The raw materials of medical theorizing now became the innumerable morbid events, occurring within the gross anatomical structures, which presented themselves to the clinical gaze on the crowded wards. Medical investigators concentrated upon the accurate diagnosis and classification of cases rather than upon the prognosis and therapy of symptom complexes.¹⁵ The sick-man became a collection of synchronized organs, each with a specialized function.

The four great innovations of Hospital Medicine were structural nosology, localized pathology, physical examination and statistical analysis. The major achievement of the Parisian School was the delineation of objective disease entities by means of correlating external symptoms with internal lesions.¹⁶ Pathology took the form of a local solidarism, focusing upon specific morbid events within the tissues rather than upon general disturbances of the constitutional system as a whole. Symptoms were demoted from the status of defining characteristics to that of secondary indicators of disease. The surface appearances were made subservient to the hidden underlying causes. Diagnosis were founded upon physical examination of observable organic structures rather than verbal analysis

of subjectively defined sensations and feelings. This was achieved during life by means of a number of specially invented 'scopes and after death by means of autopsy. Pathological anatomy, indeed, became the all pervading research technique of Hospital Medicine. A novel degree of certainty was introduced into both pathology and diagnosis by the use of quantitative methods. Statistics quickly devastated the claims of the traditional *materia medica*, and ushered in an era of therapeutic scepticism.¹⁷ The new conceptions of disease were accompanied by radical innovations in medical analogies and metaphors. Thus, for example, Rostan's theory of 'organicism' compared the composition and disposition of the organs of the body with the parts of a moving clock. Once in motion both clockwork and living organisms run out their cycles according to inexorable mechanical laws.¹⁸

Laboratory Medicine was first established within the German university system in the middle decades of the 19th century.¹⁹ The transformation in cosmology precipitated by this innovation was founded upon the application of the concepts and methods of natural science to the solution of medical problems.²⁰ The two major areas of development were histology and physiology. Numerous discoveries concerning the properties of tissues were organized into a coherent synthesis by the cell theory. The latter proposed that the ultimate structural and developmental units of all living animals and plants are the cells. Following the announcement of this theory intensive studies were made of the processes of cellular function and reproduction. Progress in physiology was largely the result of the deliberate introduction of the theories and techniques of physics into the study of living organisms, pioneered by a small group of young scientists at the University of Berlin.

Pathology also was totally reconstituted. It was asserted that observational anatomy would never explain the causes of disease. Hence the new pathology was built upon the findings of experimental physiology. Since the cell was the fundamental unit of life, then it must also be the locus of disease. Life thus became the process of interaction within and between the cells, disease a particular form of these physical and chemical processes. However, despite the success of the cellular pathology it was not accompanied by a cellular therapy. Scientific analysis swiftly dispatched the traditional remedies but offered few alternatives in their place. Nevertheless the foundations were laid for a new kind of clinical medicine. Scientific medical investigators were equally dissatisfied with the speculative systematists and the pathological anatomists. The first they regarded as unscientific and the second they believed had reified the concept of disease. All that could actually be discovered in the ailing body were cells disturbed in their functions. Medical knowledge could only advance therefore as part of a general enquiry into the complete range of cellular processes, both normal and abnormal. Clinical diagnosis was reorganized around the application of a series of chemical tests of body substances designed to identify morbid physiological processes. Medical practise became an appendage to the laboratory.

Although the medical investigators of the mid-19th century German universities varied in the sophistication of their theoretical models, all shared a strictly materialist interpretation of biological phenomena. A crusade was launched to rid biology of all vitalist concepts. The attention of the medical investigator was directed away from the living totality, away even from gross anatomical structures, towards the fundamental particles. The search was instituted for the ultimate units of analysis rather than the highest levels of synthesis. Thus the analogy chosen by Schwann to illustrate the cellular theory was drawn from the realms of organic chemistry. He argued that, even if there is no actual relation between the process of crystal formation and cell formation, they are of the same order of phenomena.²¹

Person and Object Orientated Cosmologies

The concepts of person and object orientation refer to the basic organizing assumptions embedded within a cosmology.²² From this point of view cosmologies may be regarded as constellations of meanings, generated within the structure of relationships which constitute the mode of production of medical knowledge. The form of the cosmology is a function of the form of the role structure within which it emerges. Person and object orientated cosmologies are thus systems of meaning assigned to medical events within two distinctive types of interactional network.

Role systems may be distinguished in terms of their decision making processes. A person orientated role system is one in which judgements about others are made in terms of the individual attributes of persons rather than their formal statuses, decisions being open to negotiation and discussion between the members of the group on the basis of their particularistic ideas and interests. Members attain their location in the role system through a process of mutual exploration of personal identities. Formal definition and segregation of roles is low, and members operate with a high range of verbal and behavioural alternatives. In this situation cosmology takes a form which facilitates the elucidation of the individual needs and desires of the members of the role system. Medical cosmology conceives its universe of discourse to be composed of acting and responsive beings.²³ Life, death, and disease are conceptualized as mysterious and enigmatic events, attributable to some inscrutable agency subject to its own peculiar vital principles. Medicine consists of the study of the functioning of this life-force. Ambiguity and ambivalence are commonplace in this type of role structure, and person orientated cosmologies sensitise actors to its presence. Cosmologies of this kind afford a wide range of alternatives for the expression and realization of meanings, each individual tending to evolve his own particularistic perception of his body-self. The ideational form of medical cosmology facilitates the exploration of the plurality of options available in this situation. The contemplation of the life-force is a task suited to philosophical speculation and is in principle open to differing interpretations.

In contrast an object orientated role system is one in which decision making processes are invested in the formal status of the members. Persons relate to one another in terms of the social categories to which they belong, i.e., as if they were things or objects. There is a clear separation of roles, the powers and privileges accorded to each being precisely and generally designated. Verbal and other behavioural alternatives are defined by the rules of etiquette which govern interaction between roles. Medical cosmology is structured in such a way as to reinforce the ascribed relations between the formal categories which its adherents represent. Cosmological form disparages the exploration of individual motive and intention, sensitizing its adherents to the presence of collective order. The study of medicine is focused upon the recurring, objective, quantitative characteristics of categories of the sick rather than upon the unique, subjective, qualitative differences between individuals. The universe of medical discourse is seen to be composed of inanimate objects. Living organisms and their ailments are conceptualized as law-like combinations of non-living elements and substances, life and death as physico-chemical processes. The study of life is replaced by the study of organic matter.

From Person to Object Orientated Cosmology

The eclipse of Bedside Medicine by first Hospital and then Laboratory Medicine represented a shift away from a person orientated toward an object orientated cosmology. This assertion will be demonstrated by an examination of the relationship between the ideational form of medical cosmology and the social organization of medical innovation in each of the three modes of production identified above.

In the era of Bedside Medicine the patron consisted of a small coterie of patients drawn from the ruling class. The role of medical investigator was not differentiated from that of practitioner to any significant extent. Hence the relations of production were formed in private practice and centred around the collection of fees by medical personnel from the sick. In this situation the political and economic power of patrons insured that they retained ultimate control over medical investigators and the process of production of medical knowledge.²⁴ It was the sick person who decided upon the efficacy of his cure and the suitability of his practitioner. Hence practitioners, and thus medical investigators, formulated their definitions and explications of illness so as to accord with the expectations of their clients. The latter's particularistic felt needs directed the course of development of pathology and nosology. Thus it is through an analysis of the controls generated by the dominance of the patient within the consultative relationship that the peculiar structure of the cosmology characteristic of Bedside Medicine may be explained.

The social structure of Bedside Medicine consisted of a network of segmental, unregulated patient-practitioner relationships. Medical investigators were fragmented into numerous local groups, each dedicated to the service of one part of this small but multifaceted medical market and each ranked according to the

social standing of their patrons. The various shades and grades of practitioners offered a wide selection of theories and therapies to the sick. In the absence of reliable professional, academic or technical criteria, patients selected their practitioners by means of their own personal assessment of the moral integrity and professional skill of medical personnel. The consultative relationship was thus joined on the basis of personal empathy between the parties. The sick-man sought to penetrate behind the practitioner's public performance in order to assess the veracity of the latter's claim to occupational competence and integrity. The medical practitioner, on the other hand, won the favours of his patron by individually proving his personal and professional suitability in the context of a primary face-to-face relationship. He sought to discover the particularistic requirements of his patient in order to satisfy them to the exclusion of his ubiquitous professional rivals. This delicate process of mutual exploration was conducted through a variety of verbal and extra-verbal channels of communication. Hence the consultative relationship was wide ranging, founded upon the elucidation of numerous social competences in addition to the capacity to administer and consume therapeutic nostrums. Social interaction took the form of an interpretive and inferential analysis of motives and intentions, in which both parties sought to maximize their respective advantage by probing the individual qualities of the other.

Theories and therapies played an important part in this process of presentation of self between the sick and medical personnel. The successful medical innovator was one whose theories offered the patient a recognizable and authentic image of his complaint as he experienced it. At the same time the practitioner sought medical theories which offered him the opportunity to dramatize his special healing powers and thus distinguish him from his ubiquitous rivals. In the context of these constraints a person orientated cosmology was generated characterized by two major features.

Firstly, the necessity of achieving personal rapport in the consultative relationship encouraged medical investigators to give prominence in their theories to a conception of the sickperson as an integrated psycho-somatic totality. The person of the patient in all his aspects remained the focal point of medical knowledge. The sick-man's subjective experience of his symptoms were the raw materials from which the pathological entities of medical theory were constructed. His perception of himself as a unique individual with specific personal problems of physical and mental health were reflected in the enormous variety of pathological conditions generated by the phenomenological nosology. His lack of demarcation between physical and emotional disturbance was mirrored by the integration of physiological and psychological forces in contemporary theory and therapy. His obsessive search for relief from his pains and hope of a recovery were matched by the sweeping claims of the array of heroic remedies accompanying each system of pathology. Thus in effect the patient appeared in the cosmology of

Bedside Medicine in a guise similar to that in which he appeared to himself, i.e., as an individual and indivisible entity.

Secondly, the constraints of the career system directed the creative imagination of medical investigators towards individual interpretation of the basic canons of medical theory. Consequently Bedside Medicine was characterized by a large number of competing and mutually exclusive systems, all of which could claim legitimate descent from the generally accepted principles of medical cosmology. Occupational success was dependent upon the ability to attract the interest and approval of a client or patron. Medical men sought to advertise their services by means of the allure of their own personal collection of speculations and concoctions. It was necessary for their theories to be sufficiently familiar to accord with the ideologies and expectations of the sick, whilst simultaneously sufficiently exotic to hold out an exclusive and compelling promise of cure. This multiplicity of interpretations upon a common theme was sustained by the number and variety of potential audiences which were open to the medical investigator. A range of overlapping and interlocking subcultures among the affluent sick sustained an equally various assortment of theories and therapies. Hence the social organization of Bedside Medicine stimulated the production of innumerable superficial novelties each derived from a common set of assumptions—a characteristic blend of individual display and popular conservatism. The apparent confusion, ambiguity, and the interminable controversy of Bedside Medicine were not a function of crisis within medical cosmology but rather a key feature of its normal operation.

In the era of Bedside Medicine, then, social interaction within the consultative relationship consisted of a complex process of calling forth, testing, and managing personal identities. This exchange of confidences took place, in part, through the medium of medical knowledge itself. In effect the contemporary concepts of nosology and pathology facilitated a dialogue between the sick and medical personnel which served the purposes of each by elucidating information concerning the personal qualities of the other.

Hospital Medicine represented the first major step towards the institutionalization of an object orientated medical cosmology. Two aspects of this transformation will be identified and discussed. Firstly, at the same time as the sick-man found himself unequivocally subordinated to the medical investigator, the focus of medical knowledge moved away from the person of the former towards esoteric entities defined in accordance with the perceptions of the latter. Secondly, as control over the occupational group of medical investigators was centralized in the hands of its senior members the profusion of speculative systems characteristic of Bedside Medicine was replaced by an ongoing consensus upon matters of theory and therapy.

During the Revolution the traditional institutions of medical innovation, associated with the ancien regime, were suppressed and (after an interval during

which they too were abolished) the hospitals were reconstituted at the centre of the French medical system. A two tier system of medical practice was devised in which hospital clinicians became the new elite of the profession. The thousands of poor and destitute sick housed within the hospitals had little opportunity to exercise control over the activities of the medical staff. The powerlessness of the patients, combined with an enormous size of the hospital system, provided the clinicians with an inexhaustible fund of acquiescent research material. Clinicians thus gained control over and autonomy within the technical process of production of medical knowledge. A 'collegiate' system of occupational control had emerged within the community of medical investigators.²⁵

Hospital Medicine was thus based upon a new type of relation between the sick-man and the medical investigator. Interaction between clinicians and hospital patients was organized around a nexus of formally defined statuses and strictly prescribed patterns of deference. Henceforth the medical investigator was accorded respect on the basis of the authority inherent in his occupational role rather than on the basis of his individually proven worth. The public guarantee of the safety and efficacy of theories and therapies no longer rested upon the patient's approval of their contents, but upon the social status of their authors and advocates. The new occupational standing of the clinician was matched by the emergence of a new role for the sick-man, that of patient. As such he was designated a passive and uncritical role in the consultative relationship, his main function being to endure and to wait.

These social realignments were reflected within the cosmological system of Hospital Medicine. At the centre of the new medical problematic was the concept of disease. Interest in the unique qualities of the whole person evaporated to be replaced by studies of specific organic lesions and malfunctions. Diseases became a precise and objectively identifiable event occurring within the tissues, of which the patient might be unaware. The fundamental realities of pathological analysis shifted from the total body system to the specialized anatomical structures. The experiential manifestations of disease, which had previously been the very stuff of illness, now were demoted to the role of secondary signs. The patient's interest in prognosis and therapy was eclipsed by the clinician's concern with diagnosis and pathology. The special qualities of the individual case were swallowed up in vast statistical surveys. In short the sick-man was no longer regarded as a singular synthesis of meaningful sensations. Instead the sick in general were perceived as a unitary medium within which diseases were manifested. The consultative relationship took the form of a processing exercise in which the ambiguity and individuality of each case was systematically eliminated by the application of foreknown diagnostic procedures, the function of which was to allocate the patient to a category within the nosological system. It was as a member of that category, i.e. as a suitable case for treatment, that he conducted the remainder of his relationship with his practitioner.

As medical investigators gained power over the conditions of their own recruitment, education and practise they became a much more homogeneous occupational group. A unified system of intellectual conduct could now be enforced throughout the system of production and distribution of medical knowledge by medical investigators themselves. Medical investigators obtained their posts through a system of selection which was under the direct control of senior members of the occupational group. Henceforth, therefore, the distribution of resources and rewards depended less upon the satisfaction of the patient than upon recognition among professional peers. The focal point of a career in medical innovation shifted away from the network of primary relationships with the sick toward a network of secondary relationships with other clinicians. In the era of Bedside Medicine discoveries were best kept as trade secrets to be exploited in the consultative relationship. Hospital Medicine, however, constrained medical investigators to make available their findings rapidly and openly to their occupational peers in the hope of attracting the attention of influential leaders of the profession. A battery of medical journals and societies established at the Parisian school in the second and third decades of the 19th century provided the institutional channels of this new type of career system.²⁶

Access to these communication outlets was controlled by the same group which presided over the allocation of appointments. Hence it was relatively easy for senior members of the occupational group to impose a strong commitment to common theoretical assumptions and technical procedures throughout the community of medical investigators. Thus the number of supportive audiences available to the medical investigator dwindled to one, and the market for speculative reinterpretations of cosmological principles disappeared. The centralization of power within the occupational community heralded the imposition of a cosmological form which made the controversies of Bedside Medicine redundant. Ambiguity and confusion were replaced by certainty and order.

Furthermore, relieved of the necessity of laying claim to the understanding of each and every ailment clinicians were free to introduce a new division of labour into the process of medical investigation. Occupational subgroups began to concentrate their gaze exclusively upon specific anatomical structures, each applying the same general cosmologically prescribed rules of theory and method.²⁷ As a result the integrated conception of body functions characteristic of Bedside Medicine was superseded by the fragmented and partial images of a host of specialisms. The three dimensional space of the body had been redefined. The evolution of medical specialization, then, was not so much dependent upon the accumulation of factual knowledge as upon the generation of a cosmology which permitted the application of intensive effort to the study of limited and circumscribed diseases and regions of the body.

Thus the emergence of Hospital Medicine severed the link between the concepts of medical theory and the naive experiences of sufferers from disease. Medical

cosmology no longer served as a two-way channel for the elucidation of personal qualities. Instead the cosmological system of Hospital Medicine institutionalized a set of hierarchical status differentials between the sick and medical investigators and among medical men themselves.

A new phase in the emergence of an object orientated cosmology opened with the development of Laboratory Medicine. Two major aspects of Laboratory Medicine will be discussed here. Firstly, whereas under Hospital Medicine the direction of the power differential between the sick and medical personnel had been reversed, under Laboratory Medicine the patient was removed from the medical investigator's field of saliency altogether. This increase in the social distance between the sick and medical investigators was accompanied by a relocation of the fundamental realities of pathology in microscopical events beyond the tangible detection of patients and practitioners alike. Secondly, whereas Hospital Medicine had celebrated the interests and perceptions of clinicians, Laboratory Medicine was founded upon the world-view of the scientific research worker. This transformation precipitated a total reconstruction of the epistemological foundations of medicine as a field of knowledge.

The introduction of Laboratory Medicine to German society may be illustrated by the example of Prussia.²⁸ The role of patron was undertaken by a unifying and modernizing state. Though bitterly resented by local elites which had previously controlled the universities, in the early 19th century the Prussian state centralized the academic selection procedures and played a far greater role in evaluating candidates. This policy was intended to improve German national prestige and power within European society. Hence university personnel likely to attain a continental reputation for their contributions to the advance of knowledge, rather than a local reputation for their pedagogic or therapeutic skills, were adopted as protégés by the Ministry of Education. In this manner a new breed of laboratory based medical investigators was created. Two distinct, and often mutually hostile, career systems emerged: that of research worker and that of medical practitioner. The former monopolized access to the laboratory facilities which rapidly became the essential means of production of the new medicine. Research workers grew into a self conscious and self confident elite, whose distinctive occupational ideology emphasized the value of scientific work for its own sake irrespective of its practical applications. The state, wishing to detach itself from the centrifugal forces asserted by local interests, increasingly relied upon the advice of the leaders of the scientific community when distributing rewards and resources for intellectual endeavour. Thus, by making use of the state machine, medical investigators were enabled to assert the primacy of their disciplinary interests over institutional, educational and professional ones.²⁹

The conceptualization of sickness and health developed by the early 19th century French clinicians had been limited by the exigencies of their occupational task, which restricted their gaze to morbid events occurring within gross anatomical

structures. The imagination and curiosity of laboratory scientists were not bound within these restrictions, however.³⁰ For them the study of illness became part of a much wider investigation into the organization and functions of organic matter.³¹ Morbid events were no longer regarded as a discrete area of enquiry but were studied in the context of a general analysis of both normal and abnormal physiological processes. Indeed the scientific revolution in medical knowledge may be said to have undermined the very existence of medicine as a distinct discipline in its own right. Medicine ceased to be a subject defined by its explicit and exclusive contents, and became instead an applied science, consisting of a pragmatically derived range of disciplines and techniques, distinguished by its specific purpose.

The realignment of the boundaries of the medical investigator's quest were but one part of a general metamorphosis of work tasks characteristic of the shift from Hospital to Laboratory Medicine. The occupational activity of medical investigators henceforth took the form of the extension of certified knowledge rather than the servicing of clients. The authority of the research worker was a function of his capacity to manipulate abstract symbols and concepts. A study of the emergence of occupations based on scientific knowledge must take cognisance of this transformation which is rooted in the nature of the activity itself. This development represented a significant gain in the social detachment of the medical investigator from the sick. It enabled him to conceptualize the sick-man as a material thing to be analysed, and disease as a physico-chemical process to be explained according to the blind inexorable laws of natural science. Thus whilst Hospital Medicine had dissolved the integrated vision of the whole man into a network of anatomical structures, Laboratory Medicine, by focusing attention on the fundamental particles of organic matter, went still further in eradicating the person of the patient from medical discourse.

This increase in social distance was accompanied by the erection of strong boundaries between the sick and medical investigators. Indeed the character of social relationships in the era of Laboratory Medicine gave the community of medical investigators the appearance of an insulated intellectual cocoon. Specifications for membership were exacting and exclusive. Significant communication about the causes and cures of illness was confined to the members of the group, legitimate publication outlets being reduced to a closely guarded few. The use of technical jargon and concepts served as a ritual mode of differentiation between the established and the outsiders.

The centralized homogeneous system of occupational control existing within the scientific community insured that the same set of cognitive maps and methodological prescriptions were adopted by all medical investigators. Novelties which earned their authors rewards were those which extended and articulated established principles rather than challenged and reformed them. This is not to suggest that the cosmology of Laboratory Medicine was static but rather that the ongoing

development of its potentialities occurred at the level of specification rather than interpretation. Thus the primary mode of development of medical knowledge became the creation of new specialisms rather than the reinterpretation of dominant cosmological concepts.³² However specialization in the era of Laboratory Medicine was constituted upon quite different epistemological foundations to that of Hospital Medicine. The division of intellectual labour was based not upon the injunction to study particular organs and diseases but upon the conceptual demarcations derived from scientific disciplines. Thus, for example, the problems encountered in medical practice rapidly declined as a legitimate point of departure for the discourse of medical investigators.

Ben-David and his followers have seen in the process of differentiation of knowledge into specialities and sub-fields the key to the extraordinary creativity of 19th century German science. Ben-David argues that a fierce struggle for career rewards within the university departments constrained the young and the ambitious to innovate by means of launching new fields of study. When these disciplines had matured and been institutionalized within the academic system the pioneers were first in line to collect the chairs and institutes that accompanied scientific success. At the same time Ben-David also emphasizes that the decentralized pluralistic structure of the German university system facilitated this process of subject fission. Turner has pointed out however that more significant than the mere intensity of competition was a shift towards a new kind of competition dominated by cosmopolitan and disciplinary, rather than local and institutional, criteria.

This new kind of occupational competition created a new pattern of relationships among medical investigators. The scope of occupationally relevant role performance was henceforth narrowly and specifically defined. Occupational activity took a form comparable to a game situation in which precisely identified objects are manipulated within a closely prescribed area of play according to imposed, universalistic and impersonal sets of rules. Medical investigators accounted for themselves in stereotyped and formal modes of communication which discouraged the expression of moral qualities or biographical particulars. Occupational competence was evaluated according to foreknown and general standards. This is in sharp contrast to Bedside Medicine in which occupational activity took the form of the manipulation of nebulous and elusive personal identities within an ill defined area of play around negotiated, ad hoc, and particularistic sets of expectations. In Bedside Medicine the medical investigator had sustained an ambiguous multifaceted relationship with the sick-man; in Laboratory Medicine the medical investigator maintained a clear-cut monodimensional relationship with his occupational peers. Not only had the persona of the audience altered, but also the form of the relationship. In Laboratory Medicine the interaction between research worker and audience was reduced to a circumscribed network of limited and specific exchanges. The work situation of the medical investigator thus restricted

his involvement with the object of study—i.e., the suffering of the sick and dying—to its extrinsic utility in obtaining career objectives. Hence the research worker's intellectual detachment was a function of his ulterior occupational motivation.³³

The career struggle among medical investigators was fought out through the manipulation and appropriation of scientific knowledge, the patterns of intellectual property rights playing a key part in determining the patterns of deference shown in interaction among occupational peers. The formal organization of the medical cosmology of Laboratory Medicine provided a vehicle for the institutionalization and reinforcement of a range of status obligations and role identities within the scientific community. Thus the process of innovation in medical knowledge was inspired by a belief in and a search for a single rational order in both the physiological processes of organic matter and the social inequalities among medical investigators.

Conclusion

This paper has attempted to formulate an albeit brief and incomplete sketch of one or two of the concepts which, it is hoped, may prove fruitful in the sociological explanation of changes in the perception and conceptualization of the human body by medical personnel during the course of the industrialization of western societies. Many important aspects of such a study have been neglected or glossed over here of course. Thus, for example, no analysis has been made of the processes of change within and between modes of production of medical knowledge; no reference has been made to the interaction between the production of medical knowledge and other types of cultural endeavour; no examination has been made of the relationship between intellectual production and other 'practices' within the social formation, such as the economy and polity; and so on. Attention has been drawn, however, to the changing appearance of the sick-man within pathological theory and to the changing relationship between the sick-man and medical investigators. In the era of Bedside Medicine the sick themselves determined the course of medical knowledge. The student was under the control of the object of study. The triumph of blind physico-chemical law over the idiosyncratic personal experience of the sick-man within the worldview of the medical investigator did not occur until the latter had achieved a degree of detachment from the demands of the sick.³⁴ This increase in social distance may be discussed in the context of transformations in the relations of production of medical knowledge.

Notes

1. The notion of medical cosmology bears a close resemblance to Althusser's 'problematic', see L. Althusser and E. Bailbar, *Reading Capital* (trans. Ben Brewster, New Left Books, London, 1970) esp. pp. 25–8, and also L. Althusser, *For Marx*, (trans. Ben Brewster, Allen Lane, The Penguin Press, 1971). In recent years a number of authors have formulated comparable concepts. Thus Walton and Gamble have remarked on the similarity between

Althusser's 'problematic' and Kuhn's 'paradigm', P. Walton and A. Gamble, *From Alienation to Surplus Value* (Sheed and Ward, London, 1972), p. 111. Parallel ideas are to be found in Bordieu's 'intellectual field', Foucault's 'discursive formation', Bernstein's use of 'code', and so on. None of these terms have been adopted here, however, in order to avoid responsibility for and discussion of the wider theoretical contexts within which they are located.

2. Cf. Goffman's analysis of the part played by the medical model of mental illness in the interaction between psychiatrists and the inmates of mental hospitals, E. Goffman, *Asylums* (Penguin Books, 1968) pp. 281-336.
3. The concept of the mode of production of knowledge raises fundamental theoretical issues that cannot be pursued in the present context. Recent interest in the notion has been stimulated by the work of Althusser and Balibar, *op. cit.* 'To conceive Marx's philosophy in its specificity is . . . to conceive knowledge as production', (*Reading Capital*, p. 34). The analysis offered in this paper however in no way could or would claim to be Althusserian.
4. It should be noted, after Althusser, that the raw materials of intellectual production are never direct sense impressions of an objective 'given' reality. Raw materials consist of ideas, observations, intuitions etc. that are themselves the outcome of previous productive transformations.
5. Cosmology is a concept which refers to the totality of theoretical and empirical activity, and therefore embraces elements (4), (5) and (6) in their entirety.
6. It should be noted that it is not being asserted that each of the Western European societies discussed developed each of these modes of production in a determinate sequence of development. Rather it is suggested that the medical world of Western Europe as a whole was dominated by each of these modes of production in turn, and that during the periods indicated particular medical schools represented the leading example of the mode then dominant.
7. This nomenclature has been widely used by medical historians. However the terms are rarely defined in a systematic manner or associated with the concept of the mode of production of knowledge.
8. Relatively little modern historical or sociological work has been done on the medicine of the Scottish Enlightenment, though there has been recent interest in the science of the period, see for example *Hist. Sci.* Vol. 12, Part 2, No. 16, June 1974, articles by J. B. Morrell, 'Reflections on the History of Scottish Science'; S. Shapin, 'The Audience for Science in Eighteenth Century Edinburgh'; J. R. R. Christie, 'The Origins and Development of the Scottish Scientific Community 1680-1760'. From a growing literature on this subject the following are also of particular interest, J. B. Morrell, 'The University of Edinburgh in the late Eighteenth Century: Its Scientific Eminence and Academic Structure', *Isis*, 62 (1971), pp. 158-71; S. Shapin, 'Property, Patronage and the Politics of Science: The Founding of The Royal Society of Edinburgh', *B. J. Hist. Sci.* vii (1974), pp. 122-41, J. R. R. Christie, 'The Rise and Fall of Scottish Science', in M. Crossland, (ed) *The Emergence of Science in Western Europe* (MacMillan Press, London, 1975). On medicine itself see A. C. Chitnis, 'Medical Education in Edinburgh 1790-1820 and Some Victorian Consequences', *Med. Hist.*, Vol. XVII, April 1973, No. 2; V. B. Bullough, 'The Causes of the Scottish Medical Renaissance of the Eighteenth Century', *Bull. Hist. Med.*, 1971, Vol. LXV, No. 1. Useful historical sources include: A. C. Grant, *The Story of the University of Edinburgh During Its First Three Hundred Years*, (London, 1884, 2 vols.): J. D. Comrie, *A History of Scottish Medicine*, (2 vols., 2nd ed., London, 1932). It should perhaps be noted that in some respects the Edinburgh School was unrepresentative of Bedside Medicine in that it incorporated such apparently 'advanced' or 'modern' elements as clinical facilities,

- training in practical skills, relatively high integration of physic and surgery, instruction in natural science, etc. However it is suggested that, when considered as a cosmological totality, Edinburgh stands out as the last of the great schools of Bedside Medicine. Thus, for example, on the significance of the 18th century clinical facilities at Edinburgh see M. Foucault, *The Birth of the Clinic*, (trans. A. M. Sheridan Smith, Tavistock Publications London, 1973), chapter 4.
9. N. D. Jewson, 'Medical Knowledge and the Patronage System in 18th Century England', *Sociology*, Vol. 8, No. 3, Sept. 1974, pp. 369-85.
 10. Cf. Merleau-Ponty's notion of the 'body-subject', M. Merleau-Ponty, *The Phenomenology of Perception*, (Routledge and Kegan Paul, London, 1962).
 11. General discussion of the theories of Bedside Medicine may be found in: L. S. King, *The Medical World of the 18th Century* (Chicago, Chicago University Press, 1958); L. S. King, 'George Cheyne, Mirror of Eighteenth Century Medicine', *Bull. Hist. Med.* Vol. 48, No. 4, Winter 1974, pp. 517-39; T. B. Brown, 'From Mechanism to Vitalism in Eighteenth Century England', *J. Hist. Biol.*, Vol. 7, No. 2 (Fall 1974) pp. 179-216; W. R. LeFanu, 'The Lost Half Century in English Medicine', *Bull. Hist. Med.*, Vol. XLVI, 1972, pp. 319-49; J. Schiller, 'Queries, Answers and Unsolved Problems in Eighteenth Century Biology', *Hist. Sci.* xii (1974) pp. 184-99; G. S. Rousseau, 'Sowing the Wind and Reaping the Whirlwind: Aspects of Change in 18th Century Medicine', "in P. K. Korshin *Studies in Revolution: Aspects of Change in English Intellectual History 1640-1800*. (London: The Scolar Press, 1972)." L. J. Rather, *Mind and Body in Eighteenth Century Medicine* (London Wellcome Historical Medical Library, 1965).
 12. On metaphor see; W. A. Shibles, *Metaphor*, (Language Press, White Water Wisconsin, 1971); D. Schon, *Displacement of Concepts* (Tavistock Publications, London 1963).
 13. See, for example, the system of pathology invented by the Scottish physician John Brown: G. B. Risse, 'The Brownian System of Medicine: Its Theoretical and Practical Implications', *Clio Medica*, Vol. 5, 1970 pp. 45-51; G. B. Risse, 'The Quest for Certainty in Medicine: From Brown's System of Medicine in France', *Bull. Hist. Med.*, Vol. XLV, No. 1, 1971, pp. 1-13.
 14. On the rise of Hospital Medicine in France see; M. Foucault, *op. cit.* E. W. Ackerknecht, *Medicine at the Paris Hospital 1774-1848* (John Hopkins Press, Baltimore, 1967); I. Waddington, 'The Role of the Hospital in the Development of Modern Medicine: A Sociological Analysis', *Sociology*, Vol. 7, No. 2, May 1973, pp. 211-24; G. Rosen, 'Hospitals, Medical Care and Social Policy in the French Revolution', *Bull. Hist. Med.*, Vol. XXX, 1956, pp. 124-49; G. Rosen, 'The Philosophy of Ideology and the Emergence of Modern Medicine in France', *Bull. Hist. Med.* Vol. 20 (1946) pp. 328-39; L. S. King, 'Medical Philosophy 1836-1844', in L. G. Stevenson and R. R. Multhauf, (ed.), *Medicine, Science and Culture* (John Hopkins Press, Baltimore, 1968) pp. 143-59; E. W. Ackerknecht, 'Elisha Bartlett and the Philosophy of the Paris School', *Bull. Hist. Med.*, Vol. 24 (1950), pp. 43-60; J. Ben-David, *The Scientist's Role in Society: A Comparative Survey* (Prentice Hall, New Jersey, 1971), chapter 6; R. Fox, 'Enterprise and the Patronage of Research in France 1800-70'. *Minerva*, XI (1973), pp. 442-73.
 15. Cf. Foucault's point that Bedside Medicine related to 'health' whereas Hospital Medicine related to 'normality'. M. Foucault, *op. cit.*, p. 35.
 16. The mood of the new medicine was caught perfectly in Georget's remark, 'You should paint diseases rather diseased people'. E. W. Ackerknecht, *op. cit.* p. xi.
 17. The only exception to the trend towards therapeutic restraint was in surgery, where new and radical operations were devised and carried out. Surgeons had acquired greater power and autonomy vis-a-vis both patients and other practitioners as a result of the promotion of the hospitals after the Revolution. In an era without anaesthetic and antiseptic techniques

- the new range of major operations were invariably agonizing and fatal. That they were attempted at all is evidence of the remarkable transformation of the doctor/patient relationship. See E. W. Ackerknecht, *op. cit.* Chap. XII.
18. For a description of Rostan's views see T. S. Hall *Ideas of Life and Matter* (2 vols. Chicago, University of Chicago Press, 1969), Vol. 2., pp. 251-254.
 19. C. A. T. Billoth, *The Medical Sciences in the German Universities*, (MacMillan, New York, 1924); A. Flexner, *Medical Education: A Comparative Study*, (MacMillan, New York, 1925); A. Flexner, *Universities: American, English, German*, (Oxford University Press, 1930); J. Ben-David, *op. cit.* chapter 7; J. Ben-David, 'Scientific Productivity and Academic Organization in 19th Century Medicine', *A.S.R.*, Vol. 25, (1960) pp. 823-43; E. Mendelsohn, 'The Emergence of Science as a Profession in 19th Century Europe, 'in K. B. Hill (ed.), *The Management of Scientists*, (Beacon Press, Boston, 1964); D. M. Knight, 'German Science in the Romantic Period', and W. V. Farrar, 'Science and the German University System' in M. Crossland *op. cit.*
 20. On the development of medical knowledge in mid-19th century Germany see; E. Mendelsohn, 'Physical Orders and Physiological Concepts: Explanation in 19th Century Biology', *B. J. Hist. Sci.*, Vol. 2, No. 7 1965; E. Mendelsohn, 'Cell Theory and the Development of General Physiology', *Archiv's Int. d'Hist. Sci.*, 1963, No. 65; E. Mendelsohn, 'Biological Forces in the 19th Century: Some Problems and Sources', *Hist. Sci.* Vol. 3, 1964; F. Schiller, 'Concepts of Stroke Before and After Virchow', *Med. Hist.*, Vol. 14, 1970; F. Schiller, 'Physiology's Struggle for Independence in the First Half of the Nineteenth Century', *Hist. Sci.* Vol. 7, 1968; E. W. Ackernecht, 'Cellular Theory and Therapeutics', *Clio Medica*, Vol. 5 No. 7 April 1970; E. W. Ackerknecht, *Rudolf Virchow— Doctor, Statesman, Anthropologist*, (Madison, University of Wisconsin Press, 1953); L. J. Rather, *Disease, Life and Man: Selected Essays by Rudolph Virchow*, Introduction by L. J. Rather, (Stanford University Press, Stanford 1959); E. Benton, 'Vitalism in 19th Century Scientific Thought: A Typology and Reassessment', *Stud. Hist. Phil. Sci.*, Vol. 5, No. 1, 1974 pp. 17-48; D. H. Galaty, 'The Philosophical Basis of mid-19th Century German Reductionism', *J. Hist. Med.*, Vol. xxix, No. 3, July 1974, pp. 295-316; M. Teich, 'On the Historical Foundations of Modern Biochemistry', *Clio Medica* Vol. I, 1965, pp. 41-8; T. O. Lipman, 'Vitalism and Reductionism in Liebig's Physiological Thought', *Isis*, Vol. 58, 1967; P. M. H. Mazumdar, 'Johannes Muller on the Blood, the Lymph, and the Chyle', *Isis*, Vol. 66 No. 232 June 1975, pp. 242-53.
 21. T. S. Hall, *op. cit.* p. 265.
 22. The concepts of object and person orientation are derived from Bernstein's work on socio-linguistic codes, see B. Bernstein, *Class, Codes and Control*, Vol 1 (Routledge and Kegan Paul, London, 1971) pp. 133, 165-6, 184-7. The interest of Bernstein's analysis lies in his attempt 'to explore how symbolic systems are both the realizations and regulators of the structure of social relationships', *op. cit.*, p. 194. However, the notions of person and object orientation are not necessarily used in this paper in the same manner as Bernstein has employed them elsewhere.
 23. On concepts of life and matter see T. S. Hall, *op. cit.* esp. 365-82.
 24. In terms of the very useful typology of systems of occupational control proposed by T. J. Johnson, *Professions and Power*, (London, Macmillan, 1972) this situation may be described as one of 'oligarchic patronage' (see chapter 5).
 25. See T. J. Johnson, *op. cit.* Chap. 4.
 26. See E. W. Ackerknecht, *op. cit.*, (1967) chapter IX.
 27. See E. W. Ackerknecht, *op. cit.* (1967) chapter XIV.
 28. See R. S. Turner, 'The Growth of Professional Research in Prussia 1818-1848; Causes and Consequences', *Historical Studies in the Physical Sciences*, Vol. 3, 1971, pp. 137-82.

29. In terms of Johnson's typology of systems of occupational control, 'cosmopolitan mediation', *op. cit.*, chapter 6.
30. 'Division of labour only becomes truly such from the moment when a division of material and mental labour appears . . . From this moment onwards consciousness *can* flatter itself that it is something other than consciousness of existing practise, that it *really* represents something without representing something real: from now on consciousness is in a position to emancipate itself from the world and proceed to the formation of 'pure' theory . . .', K. Marx and F. Engels, *The German Ideology*, (Lawrence and Wishart, London, 1970) pp. 51-52.
31. For an analysis of the contrasting worldviews of present-day scientists and practitioners see P. Elliot, 'Professional Ideology and Social Situation,' *The Sociological Review* Vol. 21, No. 2, May 1973, pp. 211-28.
32. Cf. The mode of scientific innovation M. J. Mulkey terms 'branching' in 'Three Models. of Scientific Development' *The Sociological Review* Vol. 23, No. 3 August 1975, pp. 509-526.
33. It is not suggested, of course, that the medical investigators of Laboratory Medicine were any more inhumane, or even instrumentally orientated, than those of Bedside Medicine. Rather the form of the relationships in which they were located constrained them to act, think, and feel in characteristic ways.
34. Cf. N. Elias, 'Problems of Involvement and Detachment', *B.J.S.*, VII, 1956, pp. 226-252.

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