

THE UNIVERSITY OF MANITOBA

SELECTIVE UNDERSTANDINGS OF REALITY AND THE NON-SELECTIVE REALITY:

A FRAME FOR THE STUDY OF SCIENCE AND RELIGION

BY

JOAN STEIGERWALD

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the University of Manitoba in partial fulfillment of the requirements
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ABSTRACT:

The frame of 'selective understandings of reality and the non-selective reality' is presented as a viable frame for considering the nature of science and religion, their interrelationship and their relationship to the whole of reality. Emphasis is placed on the radical distinction between all expressed understandings of reality, which are necessarily selective, and the non-selective whole of reality, beyond all expressions and the concept of understanding. A variety of viewpoints, western and eastern, religious and scientific, are examined in the context of the whole to provide expanded insight.

The problem of selectivity is first presented in an overview of various aspects of contemporary western culture, that is language, thought, cosmology, models of the self and religious traditions. Specific statements of the problem of selectivity and the means to its¹ alleviation are then presented from the perspective of two eastern philosophical religious systems - Nagarjuna's account of Madhyamika Buddhism and Sankara's interpretation of Advaita Vedanta. Returning to the western perspective, the problem of selectivity in the method and content of science is discussed. Finally, David Bohm's discussion of the abstracted aspect and the whole is found to illuminate the distinction between selective understandings and non-selectivity.

Exposure to new and various viewpoints is essential to man's

vitality, creativity and growth. Dogmatically extrapolating a limited viewpoint to encompass the whole is destructive and contradictory. However, particular perspectives are useful when they are orientated within the whole. Recognizing that the non-selective whole is perceived in various, although selective, manners stimulates man to realize the infinite depths of insight.

INTRODUCTION

This thesis presents 'selective understandings of reality and the non-selective reality'¹ as a viable frame for considering the nature of science and religion, their interrelationship and their relationship to the whole of reality. Emphasis is placed on the radical distinction between all articulated understandings of reality, which are necessarily selective, and the non-selective whole of reality, which is beyond all articulation and even the concept of understanding.

All man's selective understandings determine worlds which are relatively real. Whichever articulation of an understanding of reality is selected, it is only a shadow of absolute truth and less than the non-selective whole of reality. The distinction between selective understandings and the non-selective whole is not that of opposites, such as in the duality of subject and object. Nor is it a quantitative distinction, so that addition to selectivity results in a non-selective totality. Non-selectivity indicates a whole, not a conglomerate. The concepts of duality and quantity belong to the realm of selective understanding. The non-selective whole is beyond all such concepts. Selective understandings and non-selectivity are not continuous, but indicate two radically different manners of apprehending reality. Selective understanding, by virtue of its relative nature, implies the non-selective absolute. Comprehending selectivity in the context of the non-selective whole, reveals its inherent limitations as selectivity,

and reveals man's potential for transcending its circumscribed perspective. However, all perspicuity of selectivity is meaningless without the drawing power of the non-selective whole.

Each individual, each historical period and culture milieu needs a self-understanding in the context of the vaster whole. A symbol frame providing this self-understanding appropriate to a given time can arise out of the existing cultural matrix and become a viable vehicle for re-imagining prevailing insights into the whole of reality.

In modern western civilization, it is vital that any symbol frame seeking to provide meaning for all facets of life and knowledge include both scientific and religious insights. Science is a dominating aspect of twentieth century western culture. The scope and success of its knowledge has made it a powerful force. Many individuals regard science as the vehicle for establishing meaning and truth in their world. However, modern physical theories offer a cosmology which is alien to man's ordinary perception of his environment. Science is also not a field which has traditionally addressed itself to fundamental questions of existence. Thus, science alone cannot provide modern man with meaning in his life. Religion has traditionally been the realm of ultimate questioning and the provider of the meaning of existence. Yet, in the face of the power, success and scope of science, many religious images and myths appear invalidated or irrelevant. If religion is to continue to provide meaning in the modern world, it cannot ignore scientific understanding. However, most individuals have not found a means to harmonize these two facets of modern life. Society and individuals have become schizophrenic, compartmentalizing science and religion into

separate spheres, and moving in only one of these spheres at a time, at the exclusion of the other sphere.

There cannot be a common ground between science and religion unless communication is established. It is time for science and religion to become allies, as they were once in the past, forming a common force in confronting the problems of today and seeking meaning in life. The frame 'selective understandings of reality and the non-selective reality' is intended to provide the basis for such a common ground.

Both science and religion are valid attempts at understanding reality from different presuppositions and perspectives resulting in different reflective statements about reality. Both have truth and are paths in their own right. Emerging from a basic substratum, but having different points of departure and methodologies, they point to different aspects of reality. Each as articulated understandings present only selective perceptions of reality that necessarily fall short of the non-selective whole of reality. Although religion is primarily concerned with the ethereal spiritual realms, while science seeks to systematically and rationally probe physical phenomena, the distinction between the two is not rigid. Science is not strictly objective, having intuition and an awe of nature as central facets. Neither is religion strictly subjective, as empiricism, reason and abstraction play vital roles in its understanding. However, an awareness of the specifics of each must be maintained and one must not be reduced to the other. Simply intermingling science and religion weakens both and creates confusion. Nor can science or religion be absolutized over the other, for both are only articulations of understanding, incomplete in them-

selves, and both must point beyond themselves to the whole of reality that transcends and is the locus of any articulation.

Standing between science and religion man experiences tension. Subtleties of thought are needed to deal with their dynamic interrelation. Looking at both, but not simply adding one to the other, is needed for a comprehensive understanding of life in the western world. Science and religion are ultimately integrated in the non-selective whole.

Examining problematic areas and fundamental questioning results in deeper understanding and in the uncovering of new meanings. Insights must be continually restated and resought to maintain their relevance in cultures with changing experiences and perspectives. The difficult task of seeking a common frame for science and religion is vital for finding a meaningful self-understanding in a modern scientific culture.

'Selective understandings of reality and the non-selective reality' is introduced as a frame within which the problem of the interrelation of science and religion can be addressed. In dealing with a problem of such fundamental importance and complexity it is helpful to draw upon the unique insights of various expressed understandings of reality. The thesis examines a variety of viewpoints, western and eastern, religious and scientific, and thereby confronts areas of conflict and tension, in an attempt to expand horizons and seek an understanding of the issues involved that surpasses that proffered by any single perspective in isolation. These various perspectives are presented with an awareness of their inherent limitations and the importance of orientating all relative viewpoints to the whole of reality

beyond limitation.

The presentation of the frame of 'selective understandings of reality and the non-selective reality' is not an attempt to address all the issues arising from the monumental task of interrelating science and religion. The intention is to provide the foundation from which specific issues can be examined in detail with an awareness of their interrelationship to the whole field of the study of science and religion, and to man's search for meaning in the modern world.

The first chapter is a statement of the problem of selectivity in the terms of various aspects of contemporary western thought. Culture, language, thought, cosmology, models of the self and religious traditions are discussed in the context of their tendency to present man with a limited view of reality. The utility of confinement to abstractions from the infinite whole of reality is recognized. However, when consciousness of the selective nature of a given perspective is lost and a particular viewpoint is dogmatically asserted to exhaust all possibilities, destructive contradictions and conflicts arise. Thus, the importance of being conscious of the selective nature of all limited viewpoints and of orientating all selective perspectives to the non-selective whole, and man's potential for surpassing the confines of limitation, is stressed. The discussion is necessarily vague, as it is simply an overview of the numerous and complex problems arising in these facets of modern western culture.

The second chapter presents specific statements of the problem of selectivity and the means to its alleviation from the perspective of two eastern philosophical religious systems - Nagarjuna's account of

Mādhyaṃika Buddhism and Śāṅkara's interpretation of Advaita Vedānta. The philosophical nature of these two religious systems, that is their abstract, systematic and analytical presentations, results in a discussion of selectivity that is clear and concise, and intelligible and attractive to the contemporary western culture, which is dominated by scientific thinking. Both Nāgārjuna and Śāṅkara distinguish conditioned, conventional knowledge from unconditioned, absolute knowledge. Ignorance results in conventional knowledge obscuring the absolutely real. But rigorous analysis uncovers the contingent and thus unreal nature of all conventional knowledge, and negates all limitation, enabling true knowledge to arise.

Nāgārjuna and Śāṅkara are fundamentally religious in that they provide a means to escape the confines of selectivity through a spiritual path that frees man from the limitations of conventional knowledge, and the destructive contradictions and suffering arising from ensnarlment within it, to absolute knowledge and liberation. Thus, the ultimate meaning of existence is disclosed. As these two philosophical religious systems are perspectives from the eastern world, they provide unique and invaluable insight into the subtleties of the distinction between selective understandings of reality and the non-selective reality for western man.

A discussion of the problem of selectivity in the method and content of science is undertaken in chapters three and four. This shift to science also involves a return to the western perspective. However, the insights of Nāgārjuna and Śāṅkara into the contradictory and limited nature of all conventional knowledge, and the impossibility of a com-

plete, consistent and meaningful description of the phenomenal world are useful in informing an understanding of the scientific method and the cosmology presented by modern physical theories.

The methodological problems encountered in the scientific disciplines are felt even more acutely in other disciplines which are less clearly defined and which employ less rigorous research techniques. Thus, an examination of the process through which science acquires knowledge, the positivistic and purely relativistic misunderstandings of the scientific method and the usefulness, limitations and potentials of science focus on fundamental issues of methodology as such.

The modern western culture demands pragmatic knowledge and technology from physics. But it also expects physical theories to provide man with a meaningful cosmology. However, the theories being developed and the phenomena being uncovered by modern physics, and their interpretation by physicists, depart so radically from man's common sense view of his environment that they raise basic questions about the nature of science, the manner of its knowing and the value of the knowledge it discloses.

The frame of 'selective understandings of reality and the non-selective reality' provides insight into the central issues of scientific methodology and physical theories.

David Bohm's discussion of the abstracted aspect and the whole provides an excellent illumination of the frame of 'selective understandings of reality and the non-selective reality'. He is a western scientist, but with a perspective influenced by eastern and religious thought. Bohm proposes holonomy, the law of the whole, where all im-

plicates all in undivided wholeness, as the basis for new understanding. He discusses the limitation and fragmentation in the present method and content of modern physics and the meaninglessness of the cosmology offered by existing modern physical theories, and suggests a means to alleviate these problems by placing them in the context of the unbroken whole. His distinction of explicate and implicate orders is relevant for a clearer understanding of physical phenomena and consciousness, and their relationship with the whole. Bohm's discussion is comparable with Nāgārjuna's and Śāṅkara's presentations, but offers unique insights.

The frame of 'selective understandings of reality and the non-selective reality' discusses the nature of selective perspectives, and their utility if there is a consciousness of their limitation and their dangers if they dogmatically attempt to usurp the whole. It seeks to establish an orientation of selectivity to the non-selective whole, and thus to indicate the potential of human understanding and freedom. The thesis seeks basic principles as opposed to specific and detailed discussions, and in doing so explores a variety of perspectives, western and eastern, scientific and religious. The usefulness of specialized, and therefore selective, perspectives in given contexts is not disputed. However, the lack of consciousness of selectivity and the contradictory and destructive nature of taking a limited viewpoint for the whole of possible insight is criticized. In addressing such a large variety of issues and perspectives, the discussion of the thesis is necessarily general. The intention is to establish a frame in which science and religion can interrelate and thus provide the foundation for more specialized research.

1. SELECTIVE UNDERSTANDINGS OF REALITY AND
THE NON-SELECTIVE REALITY

Through an examination of the various facets of western culture, the problem of selectivity is disclosed. Discussed are both the utility of confinement to a selective viewpoint and the destructive tendencies of a particular viewpoint to become implicit and usurp the whole of understanding. When selective understanding is placed in the context of the non-selective whole, the potential for human understanding is realized.

Man is ordinarily selective in his awareness of reality. He is conscious of a limited range of experience, while being ignorant of the unlimited and unexplored realms beyond the world with which he is familiar. What man experiences is determined by what he has experienced and conceives, and supposes he can experience. The worldview which man chooses to live with is shaped and conditioned by the non-necessary assumptions of his culture. The language, logic, cosmology, models of the self and religious traditions of a given culture define the limited understandings of man's world. Different cultures function from different presuppositions, and thus present various conceptions of the world. All are valid in their own terms. But all are limited. Reality allows various non-arbitrary configurations, none of which exhaust the whole.²

All patterned worlds are relative, describing and relating abstractions from the greater whole. The particular constructive con-

vention which man lives with is necessary to organize experience conveniently and coherently. It reduces the vast amount of influxing information to a manageable proportion, enabling the establishment of concentration and significance, contrast and action. However, the limited conception man lives with is only a shadow of the whole, an aspect without meaning apart from the whole.

A particular viewpoint becomes deceptive when there is no consciousness of its incompleteness. Man's worldview tends to occupy all his attention so that events outside its range appear meaningless or untrue. New experiences and ideas are viewed as a threat to his sense of reality and are thus repressed. As this selective awareness is rooted in man's very manner of existence, everyday experiences only serve to augment it, causing it to appear a priori. In mistaking an aspect of reality for the whole, in absolutizing a relative perspective, man's limited conceptions become illusory and destructive. Misidentifications then occur and man's openness to the whole is usurped.

Continual expansion and adjustment to new experiences is necessary for a healthy society and healthy individuals within that society. Man has the potential of moving beyond limited perspectives and of becoming aware of deeper meanings, of a greater whole. He is able to become critically conscious of the selective nature of his perceptions and of the means to alter them, and to orientate all his relative conceptualizations to the whole. Only the whole of reality is absolutely real, while all man's selective understandings determine worlds that are only relatively real. A selective aspect does not have meaning apart from the whole. Thus, it is vital not to mistake the part for the whole

or to lose sight of the vaster connections.

1.1 CULTURE

The presuppositions of the culture of which man is a member provides the frame for interpreting and unifying diverse areas of experience. A particular culture is constructed of images chosen and created by man. The beliefs of this culture in turn mold man's world-view, creating an unending cycle.³

The agreement concerning what is real and possible is the most fundamental agreement in a community. Conformity to the existing social structure is stressed through positive *reinforcement* stimuli to certain behavioural patterns, and the discouragement or prohibition of other forms of behaviour. Thus, man learns to respond to the world as he believes others believe he should, and to experience only that which is socially acceptable.⁴

Man is overwhelmed by the uncertainty and responsibility of determining truth and values for himself. Thus, he craves the seeming consistency, stability and consensus of his conviction community, even at the sacrifice of his independence and freedom. He will even distrust his own perceptions, experiences and thoughts in an effort to conform to the social norm.⁵ In seeking identity with something broader and stabler than himself, the institutionalized system, his sense of nonentity is assuaged. As cultural presuppositions are rooted in man's very form of life, everyday experiences and thoughts, language and actions only

serve to reinforce them. The social norm thus rises above public questioning⁶.

Cultural beliefs and presuppositions maintain a psychic filter admitting only certain experiences and interpretations of his environment into man's consciousness. In an effort to impose and maintain the order and meaning necessary for human survival, the complexity of incoming information is reduced to a manageable fraction. Provided there is an awareness of its selective nature, the filtering process enables concentrated thought and action, without the interference of a continual deluge of irrelevant data.⁷

But if the non-necessary assumptions of a culture's limited perspective are accepted unconsciously and uncritically, man becomes a slave of his culture's worldview. They control man without his being aware of this control. The rules of interpreting and interacting with the environment become so implicit, that when data not agreeing with this conception of the world arises, they are rejected or not seen. All apprehension of a more encompassing reality is suppressed. Dissonant experiences are resisted by the community as they undermine the sense of stability and security resulting from commitment to a worldview. Once a particular viewpoint is arrived at with anxiety and expectation, the emotional investment is so great that it becomes preferable to distort experience to fit beliefs than to sacrifice the viewpoint. Alternatives lead to doubt and freedom leads to insecurity. Unusual experience is feared as it threatens man's idea of his world.⁸ When new ideas or experiences do break through, social pressure forces the repression of these perceptions. The contradiction between what is perceived and what

is determined as possible to perceive is internalized, resulting in inner conflict and neurosis. Forfeiting his freedom through fear of the unknown, man can no longer identify his creations as such, and becomes imprisoned in a particular and partial view of reality. When creativity and freedom are suppressed, society stagnates and its values become meaningless.⁹

All patterned worlds are relative. But once they become implicit, they are extrapolated to encompass all existence and absolutized. The existing social institutions become the necessary organizations, the self-legitimizing ideology inaccessible to analysis and public questioning, which usurp all values of life and restrict openness to the greater whole. In a world of numerous and diverse cultures, such rigid worldviews result in conflicts and contradictions.

However, although man's consciousness is largely conditioned and determined by the particular culture in which he lives, that cultural perspective is reciprocally informed by man. Thus, man has the potential to realize the selective nature of his social environment and to break free from its constraints. He has the power of self-direction, the ability to renounce the helpless security of conforming to the social norm and to undertake the responsibility of determining his interaction with the perception of his environment. Continual adjustment to new experience, openness, creativity and growth - all are necessary for the survival of healthy individuals and cultures.¹⁰ Thus, man needs an awareness of the limitations of his particular culture's conception of the world and an orientation to the whole beyond all limited perspectives.

1.2 LANGUAGE

Language arises from the need and pressure to communicate in a social context. It is a tool developed by man to organize and convey the knowledge and experience man gleans from interactions with his environment. A given language lifts to attention and perpetuates an interpretation of the world according to the presuppositions of the culture in which it is found. Different worldviews result in different languages and functions of language, so that unfettered communication can usually arise only where social environments coincide.¹¹ Man's intellectual disposition and experience, and his degree of being informed, provide an expectation of the probable meaning of a communicative context. When this prior information is combined with new information, a relatively specific understanding is engendered. Different languages, possessing different prior information, establish different meanings from the same situation.¹² All statements are creative interpretations of the world. Thus, what man accepts as the real world is largely unconsciously built upon his culture's habitual ways of intercommunication with other items in that world.

Language has many levels of forms, ranging from the specific, rigid or hard to the polymorphic, symbolic or soft stages of formalization.¹³

Hard language takes a form much more rigid and narrower than the ordinary language of everyday communication. Logical treatments of language strive for precise utilization of language and strict grammatical analysis. In its extreme, hard language is idealized as seman-

tically closed, and reduced to an unambiguous, abstract code that functions solely for the reduction, storage and retrieval of information. Words are seen as names with literal meanings.¹⁴ Specific mathematical formulae are examples of extremely hard language.

Language functions through contrast, and thus lays a world of separation before man. A strict subject-object dichotomy is inherent in all discursive language. Rigid grammatical treatments of language breaks language into discrete parts. In languages where nouns are treated as primary, fragmentation and duality dominate all intercommunication. In addition, the specialized uses of a single language in different disciplines, each with its own task and approach, perpetuates fragmentation between people and their understandings.¹⁵

Describing language as soft is recognizing the polymorphic and imprecise nature of most communication. Language is not merely a code. It is fluid and subtle, filled with unclear concepts, unconscious meanings and hidden interconnections. The unambiguous, hard use of language is an abstraction from the ambiguous, diverse substratum of the overall usage of language.¹⁶

Language behaviour is permeated with explanation as opposed to definition, with interpretation versus translation.¹⁷ A statement or concept is only understandable in relation to the entire context in which it is expressed. The meaning of a communication is not simply the sum of the words communicated, as this would require the total text to be known before any part is intelligible. Rather meaning is discerned and enabled to come forth with progressive immanence throughout the disclosure of the whole communication.¹⁸ To fully understand any com-

munication, it is also necessary to be familiar with the cultural context in which it is expressed. In addition, the communicator is not always clear on his intention, and unconscious meanings often influence his communication. Finally, the social and personal context of the individual who is receiving the communication affect his understanding of what is being conveyed. Thus, in any language behaviour a circular, mutual influence exists between a communication and the understanding of that communication. If there is a consciousness of this 'hermeneutical circle', its obstacles need not debilitate genuine communication.

In its soft form, language has a highly symbolic nature. Symbols enable words to point beyond literal descriptions, dichotomizing conceptualizations and specialized meanings to a whole, of which man may have an intuitive awareness, but which he cannot specify in detail. Symbols express man's capacity to transcend the limitations of concrete situations and live in terms of possibilities. Metaphors are deliberate and refined contradictions. By juxtaposing the familiar with a novel situation, they suggest new ways of understanding.¹⁹ Through symbols or metaphors man can communicate his inner and imaginative perceptions in a form that is socially rooted and acceptable. By surrendering to the potential, innate power of a symbol, something of the original experience that evoked it can be gleaned. Transforming experiences or ideas into an image keeps them dynamic, and thus alive and meaningful. Public symbols require continual adaption to the new forms of experience of a changing society to remain intellectually and culturally relevant. But as long as symbols retain their ability to point beyond precise meanings to a deeper experience they should not become static and

impotent.²⁰

There are important forms of communication besides the written and spoken word with the ability to convey much meaning. Art, music and architecture, mathematics and scientific formulae, dance and theatre, physical behaviour and expression, and so on - all have the capacity for important and profound communication.

The forms of language are clearly diverse. Examining the various facets of the so-called soft language discloses its importance. If the unclear aspects of language are omitted, communication becomes superficial. Paradoxes arise from confusing the different levels or forms of language, or from ignoring the polymorphic nature of language and seeing language only in its semantically closed, hard form.²¹ Soft language is not reducible to its hard counterpart. Its polymorphic, open-ended nature escapes precise definition, and often conceals the logical structure of language. Yet grammatical structure is needed to prevent language from degenerating into total ambiguity. The interplay of both soft and hard language, while respecting their unique spheres, leads to linguistic meaning. Thus, it is vital to look at language as a whole and to see unity in its various functions.

There are limitations to language's ability to communicate which must be respected. Thinking is richer than language.²² A man can have knowledge of something and yet not be able to precisely formulate that knowledge. Only a fraction of experience can be articulated and shared through language. The whole of existential experience extends beyond the scope of language. There are final statements which are the best possible expressions of an experience or insight which can be made in a

given context. Such an articulation may not be capable of improvement, yet the articulation falls short of the original insight and the insight falls short of the reality which triggered the insight. The non-selective whole of reality is ineffable. However, language remains useful and powerful as long as it retains the ability to point beyond itself to that which it attempts to express.

The limitations of language should be explored and exhausted before language is left behind. The ordinary language of everyday communication is, perhaps, the most powerful form of language. As it is undifferentiated and unspecialized, being common to all individuals in a given cultural context, it has the greatest potential for successful transmission of meaning.²³ Communication is also possible across cultural contexts, suggesting the existence of universal experience transcending concrete situations. Attempting communication with other cultures or language groups can lead to an awareness surpassing that achieved by one alone. Struggling with the contents and limitations of communication can lead to new insights into language and that which it seeks to express. Genuine and successful communication can carry man's own experience further, creating new experiences.²⁴

If language is not used with an awareness of its limitations, and no longer points beyond itself, it conceals the vaster whole it attempts to convey. When ordinary language becomes a familiar habit, there is no longer reflection on its limited nature and it implies that it directly describes the world.²⁵ There is a danger in man's world being limited to what he can express. However, if man is conscious of the limitations of language he can make use of its power, without be-

coming a prisoner of its limited perspective.

1.3 THOUGHT

Thinking is for the sake of experience. The application of man's mind on his experiential world determines how his world is conceived and perceived. How man thinks is largely defined by his historical and cultural milieu. Yet, the tradition which defines man's cognitions is shaped by man himself.

When man's thought processes are disciplined, distinct logical structures emerge. Logical thought is linear and structured like time. It is a series of thoughts succeeding one another through associations determined by habit, conditioning and memory. This causal sequence of thoughts is usually recurrent, resulting in relatively fixed ideas.²⁶

Man's thought structures introduce order and regularity into the wealth of heterogeneous experiences he encounters, so that his experiential world does not appear ambiguous. Generally, the perception of order is calling attention to similar differences and different similarities.²⁷ Only by contrast are ideas possible. Inherent in all conceptualization is the creation of boundaries and the dichotomization of the experiential world into subjects and objects. Once the world is analyzed into relatively separate, interacting parts, these parts are organized into an overall structure.²⁸ The conceptual structure used to organize man's experiences defines the limitations of what is real and possible. By concentrating on an abstraction of a potentially over-

whelming experiential reality and defining its systematic structure, man's world becomes logically consistent and confined.

Contemporary western cultures are permeated by an extreme rational orientation to the world. Through the insistence on the necessity of the principles of non-contradiction and identity, western man imposes a linear, determinate and unambiguous conceptualization onto all thought processes.²⁹

The logical presuppositions of a given order determine the kinds of problems and possible solutions which may arise within that order. Theories or models are specific mental constructions which aid in the solution of these problems. Reducing experience to manageable bits, these theories and models function as systematic metaphors, as selected representations of aspects of a complex system for specific purposes. Theories or models determine the manner in which various problems and phenomena are observed. They determine the facts, giving order and form to the influx of experience. A given system can lead to a variety of models. No single model is adequate, for no fixed or partial picture can completely describe the dynamic complexity of a whole system.³⁰ Models should be taken seriously for imparting useful insights into aspects of a larger whole. But they are not actual descriptions of a whole system.

Thus, thought is an instrument for grasping and shaping a conception of reality. It is necessary to determine a degree of systematic order of man's experiential environment through the dichotomizing conceptualization inherent in thought. This order provides consistency and clarity, establishes significance and contrast, and thereby enables an

understanding of the empirically given and provides a framework for constructive action. By commitment to a given order, total randomness is avoided and the discipline conducive to creative work is provided.

However, an established order remains an artificial construction with limited validity. It is a non-necessary assumption of specific thought processes which is clear and fruitful in certain domains, but not in others. It has little meaning apart from the greater whole of human experiences from which it is abstracted. No single system of logical thought nor the order generated by it has indefinite validity. As man's experiences and insights change and grow, so his logical ordering of them must adjust.

Rational, associative thought functions upon a deeper level of intelligence or insight. Insight is beyond dichotomizing thought and discursive language, beyond causal, temporal logical structures. When rational thought reaches the borders of its realm of functioning, and is quiet, insight emerges. Unlike associative thought, insight is not divisible or analyzable, but is the denial of all such thought processes. It is the removal of the confines and limitations of formal, rational thought, and allows access to the vaster whole of conscious experience.³¹

Thinking about an insight results in its being unfolded explicitly in rational thought. The particular explicit form an insight takes is influenced by the context in which it emerges. Various forms of logical thought have been developed by man, based on fundamentally different ideas. The logic founded on the principles of non-contradiction and identity permeating the western world is only a single

possibility. Other possibilities include logic founded on change, radical pessimism, irrationality, dialectics or mystical pantheism. The logics of Buddhism and other eastern spiritual philosophies radically differ from the logic familiar to western man.³² Modern physical theories are also introducing the possible necessity of radically new modes of logical thought. All these possibilities are abstract systems of thought based on insights into a more encompassing experiential whole.

When a given system of thought extols itself, imposing its particular form onto the whole of conscious experience, it is constricting. It then sees itself as being autonomous, a disinterested and self-evident necessity, totally precise and perfect. Once an original premise, which may not necessarily be valid or founded in genuine insight, is formed and takes hold, an elaborate system is built up by seemingly logical deduction from the original premise. As any logical system has been laboriously constructed, through a great deal of personal investment, those devoted to it are reluctant to question its presuppositions. It then becomes rigidly fixed and viewed as permanent. Claiming to exhaust all possibilities, it is intolerant of other possible systems of thought, and new logical attitudes are met with hostility, ignored or usurped. An intersubjective, unambiguous agreement with that logical system is demanded. When a rule no longer has an exception, it is not seen as a rule and becomes an unconscious habit.³³ Absolutizing a system of thought in this manner results in deception, distortion and contradiction. When rational thought thus ignores that it is presenting only one possible structuring of conscious experience, any foundations that it might have had in genuine insight are lost.

But no system of thought is a law unto itself. It is relative; at best an ordered abstraction of an insight into a vaster experiential whole. It is necessary to be aware of the thought process for what it is to avoid confusion and not to be trapped in fixed categories. Rational thought can be used constructively, but needs an awareness of its limitations, and an orientation to the deeper insight which is its foundation.

1.4 COSMOLOGY

A given system of thought imposes a particular ordered structure onto man's environment, thus defining an overall model of the universe. The emergent cosmology reduces the universe to a manageable abstraction. Specific patterns are delineated by which phenomena can be understood and given meaning, so that the universe is sensible and predictable. Understanding the cosmos and man's place within it has been a long-term quest of man.³⁴ All cosmological models of the universe are constructed of images created and chosen by man's thought processes and experiences, which in turn are determined by cultural presuppositions. Although man represents the universe to himself he remains a part of the universe and a creation of it. Cosmology varies, being dependent on the historical and cultural milieu in which it arises.³⁵ A given cosmology causes man only to be familiar with the universe as selection, describing and relating abstractions from a greater reality.

Science contributes a great deal of precise, detailed knowledge

of the structure of the universe, making the environment in which man must survive orderly and manageable. However science focuses its attention on the physical universe, solidifying the distinction between the human mind and the material world. Most western science reduces man's environment to a self-determinant system of efficient causes operating in the material constituents of the universe. It generally seeks to control the world mechanistically, usually ignoring the subjective elements of man's environment.³⁶

However, if cosmology is to be meaningful and comprehensive, it cannot be restricted to the interactions of physical phenomena. Genuine, traditional cosmology considers both the quantitative and qualitative aspects of man's environment as vital components to an understanding of man's place in the cosmos.³⁷

The common error of any cosmology, whether scientific or philosophical, is to infer that since the universe is comprised of particular constituents it is something particular. By extrapolating general laws from a single region of immediate experience to all other regions, it is determined what can and cannot exist in the universe. Causality, space, time, substance and other differential aspects of reality are forms in which present experience is understood. As they establish order and regularity, they become the conditions for all sensible experience. By projecting these conditions as necessities of the entire universe, the universe is represented quantitatively and qualitatively as a closed system. The universe, like any object, is thus limited to a single complexity, a particular order of things, and the potential for experiencing a vaster whole is usurped.³⁸

Man becomes so preoccupied with examining the details of his map of the universe, he misses the whole. The rules for interpreting and interacting with the universe become so implicit that man becomes their prisoner. Once man identifies with an explanation, it is no longer critically judged and contrary information does not make a connection with man's thought processes.³⁹ A misunderstanding of cosmology that disregards its inherent limitation as a particular explanation of universal phenomena, and applies that particular explanation to the whole, results in contradiction and conflict. Such illegitimate dogmatism has no place for the whole and inhibits creativity and growth.

The universe is not easily understandable, and therefore not simply representable by a single model. Universal order and man's understanding of it are provisional, changing with developments in science or other areas of human experience. A selective representation of the universe should not be taken for the entire reality. For cosmology not to eliminate itself, it needs an orientation beyond itself in the vaster context of the whole. The universe is not merely a development of man. Thus, if man is sensitive to universal forces, rather than just his preconceived ideas of them, he can learn a great deal.⁴⁰ Cosmology should be continually re-thought. It is a limited representation of the universe and if it is recognized as such, and placed in the context of a greater, unlimited whole, it will not become dogmatic.

1.5 MODELS OF THE SELF

Man also manufactures models of the self corresponding to his prevailing worldview. Man's consciousness is informed by feelings, thoughts and sensations defined by his cultural and historical context. Reciprocally, a given cultural milieu is influenced by man's self-understanding.

Ways of thinking about what the self is or ought to be lead to molding an image of the self, so that being becomes a function of knowledge. The self is thus limited by what man thinks is possible. For man to make a model of the self is to allow his thoughts to create the very reality of which they are supposed to be a model.⁴¹

The dominant worldview teaches unquestioning conformity to the existing image of the self. What man is for himself is what significant other members of society have come to see he should be, what they treat him as being. Man's appearance becomes what others see as normal. Sanctioned social standards provide positive stimuli to certain forms of behaviour and negative injunctions inhibiting the exploration of new modes of self-conception and social interaction.⁴² Social institutions are incorporated into the model of the self, as man seeks identity with something broader and more stable than himself in order to appease his sense of non-identity.⁴³ Fear of the unknown and of self-determination cause man to desire the apparent solidity and unanimity of a conviction community. Thus man denies his individuality and liberty in order to live in security. All subsequent behaviour confirming the model of the self is actually the operation of the model itself, so that a model of

the self is self-maintaining. Different forms of social conditioning lead to different models of the self, creating divisions between individuals and groups which lead to conflict.⁴⁴

Forced conformity to society's model of the self results in man's alienation from his true self. When important members of society punish man for correct self-perception, because it does not correspond to what has been established as socially acceptable, man comes to distrust his own perceptions. Instincts are privatized and repressed as defense mechanisms, often unconsciously. Such censored self-understanding and self-deception does not eliminate the conflict between man's inherent self-nature and society's image of the self. Rather, the conflict surfaces in other, hidden ways. Inner turmoil, guilt and anxiety plague man without his being fully conscious of the source of these conflicts.⁴⁵ Man is denied his potential for self-determination and self-critique, and the possibility of transcending the social context and exploring new facets of self-understanding and awareness. With no growth or sense of personal responsibility man's inner life becomes monotonous and meaningless.

Man's self image results in his seeing himself as distinct from the external world and other individuals. The dichotomizing inherent in conceptualization results in the notion of a definite, permanent conscious entity, independent of its environment and other conscious entities.

Man's consciousness is imprisoned in a personality structure that habitually captures all of his awareness. The ego is man's self-centred perspective, the limited and impoverished instrument he uses for

living in the world in his ordinary state of consciousness. Although the ego is only an aspect of the self, man clings to it, denying its relative character. The individual then becomes a divided person. One facet of consciousness splits from and regards the rest, resulting in inner fragmentation. Even in having a thought of itself, the self must distance itself from itself. A particular model of the self is only an aspect of the self, and yet it imposes its limited, fixed pattern onto the whole self, confining its developing nature. Other facets of consciousness besides the dominant, waking consciousness, which is determined by society's model of the self, are denied, leading to inner contradiction and conflict.⁴⁶

As knowledge of the fragmentary and limited nature of his self-image is painful, man suppresses awareness of this truth. Fearing the responsibility and unfamiliarity of genuine self-exploration, man prefers to confine himself to his limited model of his self and the illusion of security it exudes. The self becomes imprisoned in its self-image so that the model of the self becomes the self.⁴⁷ The limitless potential of the self, its creativity and intelligence, its originality, spontaneity and freedom, is constricted, resulting in a crisis in the individual and thus in society. Man's problems lie in personality itself, not in distortions of personality.

The self cannot be encompassed by any model. It is important to distinguish consciousness from a content of consciousness, the self from a model of the self. Any phenomenon is understood only in relation to the whole. Man's problems cannot be solved when the model and the self are confused, but only when he is aware of the pervasiveness of models

of the self and the limiting and distorting influence they exert on the self.⁴⁸ Once man realizes the meaningless and contradictory context of all models of the self, they can be controlled and eventually eliminated, and the limitless potential of the self realized. By going beyond the tyranny of the ego, by surrendering all notions of the self, man can realize the deeper levels of consciousness, the inner spiritual depths of the self, and live in terms of possibility and freedom. Then man comes to know the self in its wholeness as potentially inclusive of all things.⁴⁹

1.6 RELIGIOUS TRADITIONS

Religious traditions interpret diverse areas of experience according to the presuppositions of their cultural milieu. They are concerned with the whole of existence. Religious traditions attempt to provide access to the ultimate depths of reality and their central symbols are models for the total matrix of life.⁵⁰ They address the perennial problems of life to provide cosmic and self-understanding, and to offer a way of life and world order. Although rooted in individual consciousness, the religious community is of vital importance to the religious tradition, due to the transpersonal nature of man's spiritual life. A religious tradition is unequivocally tied to its history, its power being generated by the community of individuals, events and literature which comprise and transmit that tradition.⁵¹ A religious tradition offers a cohesive structure through which man can find meaning in

life.

Moved by a profound experience of the depth dimensions of life, man is motivated to express his understanding of reality. A final articulation of these insights is found in mature religions. The articulation is final in the sense that a better expression of this understanding of reality, in this context, cannot be found. However, any articulation must fall short of the insight which inspired it, and the insight falls short of the reality. Thus, any articulation of ultimate truth is particular.

As all expressions of insights into reality are particular, religious traditions utilize symbols and myths to convey their insights. Models systematize the symbolic representations of aspects of man's religious experience into cohesive structures which guide understanding and action in man's religious life. The value and power of symbols lie in their ability to point beyond themselves to the foundations of man's expressed insight. If an articulated understanding is defined too precisely or abstractly it becomes an idea empty of content. Symbols move beyond literal descriptions to the whole at the heart of man's religious experience.⁵²

Cultural presuppositions mold the symbols and models chosen to express man's religious insights. Interpretation enters all articulation and understanding of profound experience. Thus, there are various religious traditions, each with its own, unique presentation of ultimate truth, dependent on the worldview in which it arises.

A religious tradition must be flexible and dynamic, changing with man's experience, to remain a living truth. An authentic tradition

must be continually recreated if it is not to become redundant and meaningless. It must be tolerant of diverse experience and not attempt to usurp all existence and understanding under its particular presentation of truth. By going behind the articulation and context of a religious tradition, the ultimate experience which lies at its heart can be gleaned. A genuine religious tradition is concerned with the wholeness of reality and with essential freedom.⁵³ In its specific manifestation it is an aspect of and path to this whole. As its manifest form is particular, it must point beyond its external expressions to its ground.

If a religious tradition does not remain aware of the wider connections in which it is grounded, aware of the limitations of its models and articulations of its insights, it becomes estranged from its grounds. It then misidentifies its particular understanding of reality for the whole of reality and thus conceals the whole. Its symbols lose their power and the religion is reduced to a set of articulated dogmas. Blind institutionalized belief replaces profound experience, and religion becomes but an aspect of human existence as opposed to the central matrix of all life.⁵⁴

No amount of theorizing can tell man as much about reality as direct apprehension. Therefore, a religious tradition must not only deal with words, historical documents and systematic models of meaning and action, but with human experience. Each man must apprehend reality for himself, must have his own self-authenticating moment of insight into the whole to which a religious tradition points. Man must be open, ready to face ultimate truth where it reveals itself, to penetrate to

the level where symbols are no longer necessary, and to face the consequences and responsibilities of this experience.⁵⁵ Man must look to the whole for his own critical judgement of truth.

1.7 SELECTIVE UNDERSTANDINGS OF REALITY AND THE NON-SELECTIVE REALITY

Only the non-selective whole of reality is absolutely real, while all man's selective understandings determine worlds that are relatively real. Whatever particular model or articulation of an understanding of reality is selected, it is always an incomplete abstraction from a vaster reality. What man sees as reality and calls truth, is but a shadow of greater truth. No matter how pervasive a selection is, it is necessarily less than the non-selective whole from which it is selected.⁵⁶

The distinction between selectivity and non-selectivity is not a quantitative one, so that additions to selectivity lead to the non-selective whole of reality. Rather, it is the distinction of quantity, with the possibility of being stretched to its limits, and the truly infinite. Non-selectivity does not indicate a conglomerate, but the whole. The two are not continuous, but two radically different manners of apprehending reality. Selectivity and non-selectivity are not opposites, such as subject and object, which can be regarded as complementary aspects of existence, or which can be added or integrated to form a greater whole. The experience of the absolute is completely different

from experience in the relative world. When the limits of relativity are reached, there is a leap to the transcendent. A selective world of actual occurrences exists in consequence of not containing everything that potentially exists. The non-selective reality exists in consequence of being the whole of existence.⁵⁷

Man finds himself in a selective world. As this world is circumscribed and only contains certain things, it can be constructively structured. Selectivity is useful in providing the concentration and contrast necessary for the intelligent and significant organization of experience.⁵⁸ And, as aspects reflect the whole, of which they are parts, working with a selectivity gives some intimation of the whole. Commitment to a selective understanding enables fruitful action, provided there is awareness of its limited nature. It is important to value the relative world at its own worth, as far as it goes, but not more, and not to misconstrue it as having absolute value.⁵⁹ Selectivity is useful, but limited.

The whole of reality cannot be captured in a model, but it does allow the unfolding of various non-arbitrary configurations. None of these configurations exhaust the whole, for each describes but an aspect of reality. A given unfolded order, which is valid for certain delimited areas of experience, may not be adequate for new experience.⁶⁰ Order and man's understanding of it are time bound, and all creative or created interpretations of the world are provisional and relative. The different awareness and experiences of different individuals and groups result in different orders of existential meaning. One order may be one individual's or group's most appropriate vehicle to central truth, a

different way be more appropriate to another. No one order can usurp all the others, for each is relative and incomplete. A given order is not interesting in itself. It is interesting only as far as it reveals the whole.

As all selective understandings of reality are partial, it is vital not to be trapped wholly within a single conviction system. If a selective understanding is seen to establish the absolute boundaries of the real and possible, then it become destructive. When the partial extols itself, believing it has captured the whole, an idolatrous confusion of the part and the whole, the symbol and the reality, occurs. Through illegitimate dogmatism a partial order becomes a reality of its own, with little connection with actual reality. Man becomes trapped in this partial image of reality, caught in the details, and misses reality as a whole. The identification with a created order becomes implicit, so that all experience not agreeing with it is rejected. In losing sight of the role of his model, man becomes its prisoner, limiting reality and thus causing contradiction and crisis.⁶¹

Man's problems cannot be solved when he confuses his selective models with the whole of reality.⁶² To be released from the prison of a limited model of reality man must first become aware that the model exists and then realize that the model represents only a selective aspect of reality. Man must be conscious and critical of the role of models. He must admit his cultural conditioning, and yet recognize that his presuppositions can be analyzed and discussed. Working reflectively and with discrimination in a selective viewpoint enables man to discern its inherent limitations and relativize that perspective.

Once man is conscious of the role of his selective viewpoint, he can manipulate it and can interfere with its stabilizing forces. Questioning and pointing to things problematic opens man to new understandings. In abrogating the constraints of his ordinary selective awareness, man is unsettled and stimulated. By being receptive to the viewpoints of others, and accepting diverse experience, new insight can be attained. There is risk in forsaking the old for the new, and fear of the unknown often acts as an obstacle to expanded experience. However, the boundaries of the possible are continually being challenged.⁶³ Man does not attain full awareness of most challenges, because his habitual experience patterns suppress them. Nevertheless, some succeed in forcing themselves into man's consciousness, resulting in a shift in his idea of what is real. All is possible if man is open, allowing the whole to reveal itself.

Growth expansion and creativity keep man alive. As new meanings and new ways of looking at problems emerge, it is vital to continually reorganize experience in new and creative ways. Emptying himself of all selective viewpoints enables man to give free play to his spiritual core of infinite potential. In the depths of man's consciousness there is something which touches and is identical to the whole of reality. At this point identity and dichotomy dissolve. All merges in undivided wholeness. All are mutually enfolded aspects of the whole, with each aspect reflecting the whole.

Selectivity must be understood in the context of the non-selective whole. By understanding the nature of selectivity, it can be pushed to its limits and transcended. Selective viewpoints should be

utilized consciously, critically and responsibly, and with an awareness of the relation to the whole. Any aspect is interesting only as far as it reveals the whole, and can be judged only in relation to the whole. Only the non-selective whole of reality can be accepted as absolutely real.⁶⁴

Each selective understanding implies the non-selective whole of reality by its very nature as selection. All relativity establishes an absolute to which all relates. Thus, any effort to absolutize a selective viewpoint is rendered inadequate, contradictory and destructive. However, without the non-selective whole of reality all recognition and explanation of the limitations of selectivity are meaningless. To attain the infinite, it is not enough to push to the boundaries of selectivity. The pull of the non-selective whole is necessary. The transition from selective understanding to the non-selective whole is not continuous, but a leap into a wholly different awareness.⁶⁵

2. ILLUMINATIONS OF THIS FRAME BY TWO PHILOSOPHICAL RELIGIOUS SYSTEMS

To illuminate the subtleties of the distinction between selective understandings of reality and the non-selective reality, a discussion of two very concise and coherent philosophical religious systems is provided; that is Nāgārjuna's account of Mādhyamika Buddhism and Śaṅkara's interpretation of Advaita Vedānta.

Not only do Nāgārjuna and Śaṅkara disclose the limited nature of all relative knowledge, as opposed to ineffable, infinite absolute knowledge, they also offer a comprehensive means for breaking free of the confines of limitation to attain absolute knowledge. Since they provide a means, a spiritual path, for liberating man from the bondage and suffering that results from attachment to the ideas and objects of thought, which arise in ignorance, Nāgārjuna and Śaṅkara are fundamentally religious. They provide a spiritual discipline that purifies the mind of conceptualization and false belief so that eternal knowledge and liberation can arise unfettered, thus establishing ultimate meaning.

I call the religious systems of Nāgārjuna and Śaṅkara philosophical because of the systematic, analytical and abstract nature of their presentations. Nāgārjuna and Śaṅkara distinctly state that relative knowledge, which is rooted in ignorance, obscures absolute knowledge, and they methodically negate all relative knowledge as dependent and limited, and therefore unreal, so that true knowledge can be dis-

covered. This philosophical orientation is appealing and comprehensible to modern western thought, which is dominated by science and rational analysis.

2.1 MĀDHYAMIKA BUDDHISM - NĀGĀRJUNA

Mādhyaṃika Buddhism, as elaborated by Nāgārjuna,⁶⁶ is concerned with the conditions which govern the transcendental intuition of absolute truth, and seeks to distinguish absolute truth from conventional truth. An analysis of the fundamental factors of existence and the dichotomizing conceptualization of conventional knowledge reveals them to be empty of real existence and truth. They are merely illusory fabrications which obscure and distort the absolutely real. Through a rigorous negative dialectic Nāgārjuna reveals them as such and removes these impositions on reality, thus freeing man for the transcendental intuition of absolute truth. Nāgārjuna avoids the extremes of dogmatism and meaningless nihilism, presenting only a means to remove ignorance and allow the unfettered rising of true knowledge, which is absolute freedom.

2.1.1 Conventional and Absolute Truth

Nāgārjuna makes a radical distinction between conventional and absolute truth. Conventional knowledge (saṃvṛti) perceives the conditioned world of man's everyday experiences, which is only relative and apparent, and not truly real. It discerns reality with the particular viewpoints of dichotomizing conceptualization, thereby restricting and falsifying reality. Absolute truth (paramārtha) is reality free of all conditions and limitations. It is ultimately real.⁶⁷

Penetration into the phenomenological world perceived by conventional knowledge reveals that it exists and is conceived only through dependent relations. Dharmas are the fundamental factors constituting all existence as it appears to the discriminating mind. The world is composed of an endless series of simple, momentary ultimates, which, in combination, are exhaustive of the epistemological components of the description of all phenomena.⁶⁸ However, dharmas derive their nature only through conditioned co-production. Each is a reciprocal relationship with all other factors of existence, with its nature being the result of the co-operation of all conditioned factors. But what arises in dependence lacks self-nature and does not arise in truth. Any relative and functionally dependent thing can exist and be conceived only through and in its relationships. By itself it is nothing. Thus, the mutually contingent dharmas lack self-sufficient independent reality. They are empty (śūnya) and ultimately unreal.⁶⁹

The entirety of phenomenological existence is an everchanging succession of dharmas. Every thought, sensation and volition, every

human being and object - all experience is a collection of dharmas. Things take on different forms due to the varying nature of the groupings of the dharmas. As contingent dharmas are not real in themselves, all compound things derived from them are also unreal.⁷⁰ All things lack ontic self-existence - all are empty and unreal. Thus, the world of ordinary experience discerned through conventional knowledge is relative and apparent, and empty of reality.

However, ignorance (avidyā) of the dependent and unsubstantial nature of all experiential phenomena imputes erroneous self-existence onto things. Ignorance arises from the non-apprehension of real truth. By attributing intrinsic value to appearance, ignorance results in attachment to objects and ideas as if they were genuinely real. Ignorance leads to dichotomizing conceptualization with the manifold of named things as its objects.⁷¹ The thought constructions of conventional knowledge seize onto falsely discriminated entities as if they were absolutely existing, and thus sees reality in terms of identity and distinction. The illusory imputation of self-existence onto what is essentially contingent and empty of real existence results in an invalid view of the world.⁷²

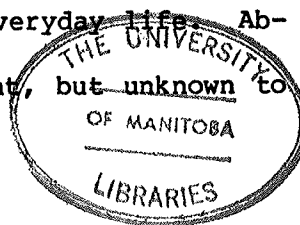
In a radical distinction from conventional truth, absolute truth is not conditioned or relative. The absolute is free of the possibility of limitation or change, identity or distinction. It is absolutely isolated having nothing as its condition, not even its own nature (svabhāva).⁷³ If the absolute were to have self-nature, it would be implied that the absolute regards itself, thus dividing itself from itself. As the absolute is beyond all dichotomy, it is also empty of

self-nature. It is unperverted by the limitations of dichotomatizing conceptualization and points of view, and devoid of all prediction. Ultimate truth is the absolutely real compared to which all dharmas of conventional knowledge are relative. Absolute truth is true knowledge of the way things are in truth. It is the thus-ness of things (tathatā).⁷⁴

Thus, Nāgārjuna distinguishes two truths - the absolutely true and the apparently or conventionally true. The absolute viewed through ignorance and its resultant relative conceptualizations is the phenomenal world. The phenomenal world empty of these limitations is reality as it is absolutely.⁷⁵

These two truths are irreconcilable and must not be confused or overlapped. However, they do not indicate two separate spheres or sets of objects. The absolute is the sole reality, the only truth, the reality of the apparent. It is not another thing besides the world, but the world without distortion. Nor do these truths differ in degree. Conventional truth is not a partial truth requiring addition to be made whole. Absolute truth is not simply one kind of knowledge amongst others, but is of a different nature. The difference between absolute truth and conventional truth is not ontological nor quantitative, but epistemological. Reality puts on different forms due to the manner of man's apprehension.⁷⁶

The two truths are different reflective statements about reality, and both have their place. Conventional truth, although totally false from the absolute standpoint, is valid for everyday life. Absolute truth is not false from the relative standpoint, but unknown to



those ignorant of the true nature of reality and entrapped in phenomenal existence.⁷⁷ From the ordinary viewpoint the absolute is nothing, since no category of thought is adequate to it. The absolute is not affected by the distinction between absolute and conventional truth. Once aware of absolute truth the distinction is unnecessary, and from the absolute standpoint the distinction is non-existent.⁷⁸

Conventional knowledge conceals the real nature of reality and makes it appear other than it is in truth. Ignorance of the contingent and thus empty nature of all phenomena results in the imposition of illusory fabrications onto reality as actually real. Absolute truth is obscured and distorted by the dichotomizing conceptualization resulting from this ignorance. Conceptual thought leads to the afflictions (kleśas) of possessive desire (rāga) for and aversion (deveśa) from apparently existing objects and ideas, and of the illusion that everyday things are ontological entities (moha). The combination of these afflictions binds man to apparent conventional existence. All ideas are but false constructions, and to entertain concepts, believing they are real, is a habit ensuring bondage. Attributing permanent existence to appearance leads to endless cycles of suffering.⁷⁹

Absolute truth is attained only through the removal of false constructions of conventional knowledge which obscure it. The distinction of absolute from conventional knowledge reveals the true nature of dharmas as contingent and unsubstantial, and thus empty of true existence. Ignorance of this emptiness results in the existence of the world of ordinary experience and attachment to it as truly existent. With the removal of ignorance, the apparent existence of the phenomenal

world dissolves and nothing is left of the false views of conventional knowledge.⁸⁰ Critical reflection on the nature of conventional experience and knowledge leads to consciousness of the illusory appearance engendered by ignorance and its eventual negation as a distortion and obstruction of true knowledge.

2.1.2 The Negative Dialectic

Nāgārjuna employs a negative dialectic to void the mind of all conceptual determinations erroneously ascribed to the real. This subtle and consistent critical analysis dissolves all superimposition and hindrance to the real, so that true absolute knowledge can arise. Absolute truth is not produced, but discovered through the refutation and removal of all false views.⁸¹ It is not the attainment of absolute knowledge, which is eternally existent, but the removal of obstructing ignorance.

Nāgārjuna's negative dialectic is the critique of all philosophy as inherently leading to dogmatism, conflict and contradiction as it is attached to ideas and dharmas as self-existent entities and insists on the absolute truth of relative conceptions of the real. It exposes the unacceptable logical consequences of all viewpoints. Reflective awareness of the true nature of categories of thought reveals them to be limited, applying only to the phenomenal and not to the real.⁸²

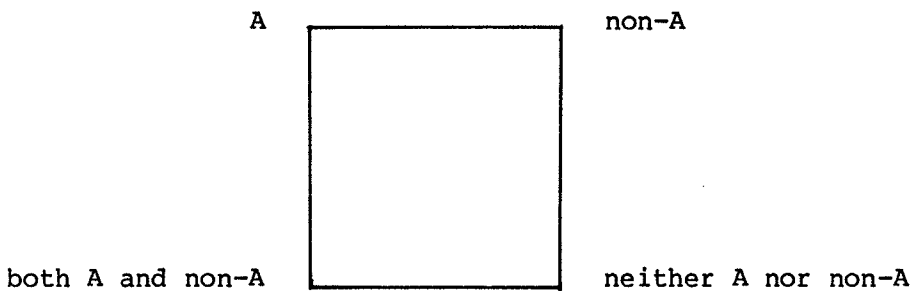
Dogmatic philosophy is a misunderstanding of the transcendent in terms of the empirical. It illegitimately extends logical⁸³ categories

to the unconditioned, while they are only valid in conditioned existence. Disregarding its limitations, it has the pretension of being the only complete picture of reality. As there are many philosophical viewpoints, each a limited construction of conventional knowledge, an interminable conflict between varying views arises when each attempts to establish itself as an absolute norm. Generally, when a particular view is refuted, it is through opposition to another view, which is then grasped as true and as the logical progression from the previous view. Lacking critical awareness of the inherent limitations of all viewpoints of conventional knowledge, logical enquiry becomes an endless task, never attaining ultimate truth.⁸⁴

Nāgārjuna's negative dialectic exposes the false pretensions of all logical systems by subjecting each to a penetrating analysis and critique. By drawing out its implications according to its own logic, principles and procedures, every view is reduced to absurdity and rejected ruthlessly as inherently ambiguous and contradictory, and therefore untenable. A given thesis is pursued only until the holder of that thesis is convinced it is illogical. Every thesis is self-convicted in this manner strictly for the benefit of the thesis holder, with no antithesis being posited. It is an absolute negation of each and every thesis which does not result in an affirmation of its opposite. A partial philosophical proposition is rejected, not so that it can be replaced, but to eliminate all such false assertions.⁸⁵ The point is to disclose the conflict and confusion in logic.

2.1.3 The Use of the Catuskoti

Nāgārjuna demonstrates the conflict inherent in all logic and viewpoints by a method of argumentation that demolishes all assertions on any matter, the four cornered Buddhist argument or catuskoti:



The tetralemma is exhaustive of all possible arguments, and each alternative is accepted hypothetically and then rejected. Each of the first two alternatives, A and non-A, that is that the phenomena or idea presented exists or has being or, in the second alternative, does not exist or have being, must be intelligible in itself, without reference to its opposite. But every conceptual position points to its counter position, with each positive assertion being correlated with its negation. As the first two alternatives are mutually dependent, neither stands on its own as a plausible argument and thus each is rejected. Nothing can meet the demands of self-existence, as there is no element of existence which does not arise dependently. Therefore, nothing is non-self-existent. Both are false dogmatic positions. The third alternative combines the first two alternatives, both A and non-A, resulting in a contradiction and thus must also be rejected as an invalid

argument. The fourth alternative, neither A nor non-A, is not understandable and must be thrown out as well. As the third and fourth alternatives depend upon the first and second, throwing out the first two alternatives logically leads to rejecting the last two alternatives.⁸⁶

Through relating each of the four possible alternatives of the catuskoti to each philosophical concept, Nāgārjuna demonstrates the inapplicability of any concept to the real. As all dharmas and ideas are empty of own being, the constructions of these four positions cannot apply to them and must be rejected.

Nāgārjuna rigorously examines the various concepts ordinarily utilized to establish experience on a coherent and acceptable basis, by an application of the four arguments of the catuskoti, to disclose all such ordering as unintelligible. For example, the concept of production is revealed to be contradictory and irrational. Entities of any kind cannot originate by themselves, nor by others, nor by the co-operation of themselves and others, nor without any cause. Spontaneous origination is not an acceptable idea, and if a thing already exists it cannot originate again by itself. The origination of a thing by others assumes the origin of a thing already existing. The origination of a thing from both itself and by others is contradictory. Origination without any cause is not an intelligible concept as entities would be coming into being at all times without any basis.⁸⁷

"Nothing existent is brought forth, because it is in existence; nothing non-existent is brought forth because it is not in existence; nor anything both existent and non-existent, because no thing has mu-

tually contradictory attributes So, as no effect is produced, there is in consequence no cause."⁸⁸

If an effect is totally different from its cause, no relation can exist between the two - they would both exist independently. If an effect is equal to its cause, there would be no difference between the two - they would be identical. Both cases demonstrate the irrational nature of any attempt to explain causality through the assumption of self-existent entities.⁸⁹

Nāgārjuna applies similar and exhaustive arguments to any proposed philosophical concept. In this manner time, motion, perception, material objects, the agent and his acts, character and its characteristic, the self and so on are all shown to lack independent self-existence and therefore reality.⁹⁰ Even Buddhist doctrines are subjected to Nāgārjuna's penetrating critique. None of the four positions of the catuskoṭi can be logically applied to the four noble truths, to nirvāṇa, to the Buddha and so on, demonstrating that all these Buddhist concepts are empty of genuine self-existence. None of the four positions are valid. Each is merely a conceptual construction which is disclosed to be contradictory and unintelligible under rigorous critique.⁹¹

The categories of thought that provide the seeming reality of objects of conventional truth are found to be ideas without ultimate significance. All conventional knowledge depends on differentiation. Existing only through contrast, mutually dependent ideas have no intrinsic meaning nor value. Nāgārjuna's critical dialectic uncovers the true nature of philosophical knowledge and factors of existence as being empty of independent self-existence and, therefore, reality. No con-

ceptual account of the world can be given, as all such accounts presuppose self-sufficient existence. Thus, the negative dialectic shatters all attempts to provide an intelligible account of the world. Its rigorous critique of all views as contradictory and empty of real truth demonstrates the inadequacy of all rational thought.⁹²

The negative dialectic was anticipated by the Buddha's silence to certain types of questions. These came to be called the fourteen unresolved questions or inexpressibles and are as follows:

"Whether a tathāgata exists, does not exist, both exists and does not exist or neither exists nor does not exist; whether the world (of living beings loka) is finite, infinite, both finite and infinite, or neither finite nor infinite; and whether the world (of living beings) is eternal, not eternal, both eternal and not eternal, or neither eternal nor not eternal. In addition ... the relationship between a vital principle (jīva 'soul') and the body which is envisaged under only two headings, viz. whether they are different or not different."⁹³

The Buddha refused to respond to any of these moot points when questioned about them, as any answer would be inadequate.

As they try to explain delusive appearances in terms of delusive appearances, all concepts are pretentious by nature. That which is not what it pretends to be is unreal. Thus, all that is negated through Nāgārjuna's dialectic is unreal.⁹⁴ The success of this dialectic is measured by the lessening of the cluster of ideas blocking clarity of mind and genuine grasping of the way things are in truth. It results in a progression from appearance to reality.⁹⁵

2.1.4 Positive Apprehension of Absolute Truth

Nāgārjuna's negative dialectic is not simply a destructive process, but is used together with meditation to prepare the ground for true insight. The negative dialectic deconceptualizes the intellect, removing all hindrances to the positive apprehension of absolute truth⁹⁶. However, it is not enough to be intellectually convinced of the emptiness of all dharmas and conceptual constructs. Emptiness is meaningful only with a definite spiritual attitude. Meditation discloses its profundity and engenders an immediate experience of absolute truth. As the intuition of genuine knowledge grows through spiritual discipline, the freedom from attachment to limited knowledge also advances.

The critical dialectic frees the mind of false conceptualizations so that true knowledge may arise. By pursuing concepts to their logical conclusion, Nāgārjuna's critical examination leads to a reflective awareness of the limited nature of all conceptual construction. It thus voids the mind of the obscuring determinations of assertive verbal statements and discursive thought, and their objects, thereby dissolving attachment to the false appearance of the phenomenal world. Freedom from afflictions and suffering arises from the annihilation of bondage to these empty determinations. Through selfless renunciation, rejecting all supports and excluding all that could distract or impede, the mind becomes calm and translucent. Clearing the mind to such a state of purity and even-mindedness opens it to ever-present absolute knowledge. Thus, the dialectic is not an endless,

destructive process. Once limitation is removed from limited truth, true and immediate intuition (prajñā) of genuine truth arises.⁹⁷

Absolute truth is not produced nor acquired, but is known by being uncovered, which the refutation of all viewpoints accomplishes. When ignorance (avidyā) is negated, only what is real, true knowledge, remains. This process does not constitute an ontological change, but is a change in apprehension, a change in the manner of knowing.⁹⁸

Prajñā is super-rational, non-relative, perfect wisdom, the pure, immediate intuition of eternal and invariable absolute truth. It is freedom from ignorance and suffering, and from all limitations. Perfect gnosis is empty of identity and difference, beyond the distinctions between subject and object, affirmation and denial, existence and non-existence, and conditioned and unconditioned reality. When the object of the mind is negated, there is nothing to which knowledge refers. Thus, true knowledge is contentless and independent. Absolutely isolated, it is devoid of any relation and specific characteristics or marks. With no properties to recognize it by, absolute knowledge is ineffable and inconceivable.⁹⁹

Absolute truth is a positive apprehension. It is infinite knowledge of the way reality is truly, the discovery of true such-ness (tathatā). However, Nāgārjuna does not posit a substantial absolute essence as the unconditional eternal source of all phenomena. He is positing an absolute truth, not a thing. Absolute knowledge is a positive apprehension, yet nothing can be said about it which will not become an object to which to cling. Thus, absolute knowledge is ul-

timately inexpressible, incomprehensible and unteachable. The only response from the highest level of insight is silence. But, this emptiness of absolute truth is the ultimate fullness of all.¹⁰⁰

2.1.5 The Limited Usefulness of Conventional Knowledge

Nāgārjuna is aware of the problem of using language, which is based on dichotomous conceptual structures, as a means to release man from deceptive conventional knowledge. Absolute truth cannot be reached by words.¹⁰¹ Nāgārjuna's critical analysis demonstrates the limitations of words. As they lack independent existence, all language constructions are ultimately empty. Thus words apply only to conventional truth and not to knowledge of the real as it is truly.

Nevertheless, words are necessary to indicate and teach higher truth to those attached to conventional truth. The emptiness of all existence cannot be genuinely conveyed through words, yet words are used to give some idea of ultimate knowledge. Nāgārjuna utilizes words in a secondary sense. They are not intrinsically meaningful, but they are pragmatic and tenable guides to surpassing understanding or awareness (prajñapti). The particular linguistic mode manifested by Nāgārjuna in a particular situation is appropriate to the level of understanding of the individual being instructed. Nāgārjuna utilizes language only as a provisional, practical tool and is aware of its inherent limitations.¹⁰² Ultimately he discards all words as inadequate.

Nāgārjuna is aware of the difficulty the Mādhyamika system presents to ordinary understanding. The doctrine of emptiness is easily

misconstrued as it is so radically different from conventional concepts. The sheer transcendence of absolute truth does violence to ordinary thought processes.¹⁰³

Nāgārjuna does not deny the utility of logical constructs in the realm of ordinary experience. Conventional formalizations can provide much consistent and clear practical knowledge. Bewilderment is not necessarily conducive to understanding, while what is familiar can often be quite efficacious. Conventional knowledge is not destructive in itself. Rather, it is the dogmatic insistence on the absolute truth of a particular and limited conception of the real, as opposed to seeking knowledge of the real as it is truly, that results in self-deception and suffering. Nāgārjuna distinguishes between concepts defined as self-subsisting entities in themselves and thus leading to delusion, and those used in a practical sense, but understood as being relative and empty.¹⁰⁴

The negative dialectic is employed as a means to disclose the limitations and emptiness of all language and conceptualization and thus disentangle the mind from its attachment to them. Through a critical examination, thought processes are penetrated to the point where language becomes paradoxical and logic turns against itself, and then can be transcended.

The negation of all viewpoints takes into account the various dispositions of those to be guided and offers refutations accordingly. For initiates on the path to true knowledge, the principles of formal logic are retained and popular notions are employed to confute popular theses. For those more advanced, contradictions are used to break attachments to habitual thought patterns. Eventually even paradoxes are

left behind on the road to true awareness.¹⁰⁵

The alternatives of the Buddhist four cornered argument (catuskoti) are valuable in accommodating aspirants of various insights and progressively indicating something of the nature of ultimate truth. The denial of being counteracts the commitment of the ignorant to the factors of the phenomenal world as existent entities. For those who become attached to denial as self-existent, non-being is also negated. The final two arguments are more subtle and are designed for those who possess a faint understanding of emptiness. None of the four arguments have intrinsic power, nor are valid from the standpoint of true knowledge.¹⁰⁶ Finally, the entire process of the catuskoti is negated.

Buddhism provides a path in terms of conventional knowledge to guide the ignorant to genuine knowledge. Based on the insights of those who have attained true knowledge for themselves, its teachings have an established authority. The various Buddhist doctrines are useful antidotes to suffering when applied in a manner suitable to the specific diseases of different individuals.¹⁰⁷ For instance, the Buddha, the perfected being (tathāgata), is the personalized aspect of emptiness in Madhyamika Buddhism and functions as a mediator between absolute and conventional truth. As absolute truth personified, the Buddha becomes an object of devotion and meditation. He appears out of infinite compassion (karuna) for the salvation of all. As emptiness, the Buddha is in the realm of absolute knowledge. While possessed of compassion he is in the realm of conventional knowledge. Partially in the conditioned and partially in the unconditioned, the Buddha can apprehend absolute truth and reveal it to those ignorant of it. The Buddha discloses truth

only from the relative perspective, and he is only a concession to ignorance.¹⁰⁸ Similarly, all Buddhist doctrines are useful in the world of conventional thought. However, they have no ultimate truth and must finally be negated as empty. "No doctrine about anything at all has been taught by Buddha at anytime."¹⁰⁹

Nāgārjuna also accepts the pragmatic distinction between conventional and absolute truth for the convenience of instruction.¹¹⁰ The two truths are different manners of knowing. Conventional knowledge, although false from the point of genuine truth, is valid and useful in the realm of ordinary existence dominated by ignorance. Absolute truth is not false from the relative perspective, but unknown, as no ordinary category of thought is adequate to it. Conventional knowledge is useful to dispel attachment to entities and ideas as self-existent and to discuss the limited value of all conventional thought processes, and so indicate something of true knowledge. Absolute truth is not affected by the distinction, and once true knowledge is attained the distinction becomes non-existent. There is only one truth, the way things are truly. Absolute knowledge is empty of all duality and therefore of any distinction between the conditioned and unconditioned.¹¹¹ Thus, ultimately the distinction between the two truths must be negated.

The language of negation and emptiness is used to provide some idea of absolute knowledge. It is not possible to state what truth is without the assertion becoming an object of attachment, and thus truth is not positively described. However, what is not truth can be stated. Nagarjuna denies a series of attributes to absolute truth, without bestowing it with any contrary attributes. To indicate absolute truth,

which cannot be reached by words, it is discussed as emptiness. Emptiness is not an attribute or viewpoint, but a symbol indicating the exhaustion of all words and viewpoints. One for whom emptiness becomes a theory is incurable. Thus, Nāgārjuna declares the emptiness of emptiness. Even emptiness and negation are without genuine reality and must be denied.¹¹²

Negation itself is only a means and lacks an affirmative basis. It is a technique to break down all theories and representations of true knowledge. But Nāgārjuna ultimately denies his own denial. As nothing can be said that does not become an object to cling to, say nothing.¹¹³ Only silence expresses ultimate truth. However, where this silence is not understood, Nāgārjuna uses the above techniques.¹¹⁴

2.1.6 Avoiding the Extremes of Dogmatism and Nihilism

Nāgārjuna does not present a nihilism leading to mere naught. He claims nihilists are naive realists who do not truly understand the lack of self-existence in things due to their dependent origin. He denies calling the negation of being the affirmation of non-being. Voidness as ontic existence is destructive, and the dogma of non-existence is refuted equally with the dogma that things are in being. Negation is not the goal, nor is emptiness an attribute for the inexpressible absolute truth. Negation is a means and emptiness is a symbolic pointer to true knowledge, but ultimately both must be denied. Negation removes the constrictions which dichotomizing conceptualization

and discourse place on the real, including the statement claiming the emptiness of all. But the end of all conceptual constructs is not the end of meaning. The refusal to define absolute truth is not its denial. The denial of absolute being to the world does not reduce it to nothing.¹¹⁵ Once all limitations are removed, the way things are in truth, the so-ness or thus-ness (tathatā), is discovered, and this is a positive apprehension.

Correctly understood Nāgārjuna is not dogmatic. To take any conceptual position results in dogmatic doctrinal extremes. Emptiness is the avoidance of essential differentiations, and repudiates both existence and non-existence as dogmatic. Nihilism and realism are two extremes derived from discursive thought, and as both are equally devoid of reality, both are eschewed. Nāgārjuna voids and transcends the dualism and extremism of all positions and ontic systems. His is the middle position, which is no position.¹¹⁶ He does not posit his own view, but provides the means to realize the emptiness of all views and representations of reality. Nāgārjuna presents his self-conscious critique of all dogma as a destructive technique, without providing opposing construction.

2.1.7 Spiritual Freedom

Nāgārjuna's emptiness is meaningful only with its definite spiritual orientation. Taking things as real results in hypostatizing thought with named things as its objects. The resulting afflictions of

aversion, desire and illusory belief in ontological entities cause endless cycles of suffering. Nāgārjuna provides a spiritual discipline which seeks an end to suffering by purifying the mind of all attachment, defilements and hinderances. The ignorance leading to the false imposition of existence onto what does not truly exist is removed by cleansing the mind of conceptualization of the real. Once freed of false belief and conceptualization, all attachment and therefore suffering cease. In a total renunciation of the self, and all ideas and objects of thought, of all that could disturb, a spiritual regeneration occurs.¹¹⁷ With clear vision, absolute truth is experienced. It is a way of liberation through the true knowledge of the meaning of emptiness. The turmoil of life ceases, bringing peace, bliss and perfect purity. Emptiness is nirvāṇa, spiritual freedom, the empty relation of all in total freedom.¹¹⁸

All that has been said of emptiness is true of nirvāṇa. Nirvāṇa is release only if it does not become an object to be grasped. Nirvāṇa cannot be attained if it is desired. Only the rejection of the last fragment of attachment allows nirvāṇa to arise. Nirvāṇa is that which can neither be made extinct nor realized through action. Nirvāṇa cannot be said to be something to attain without resulting in a false distinction between nirvāṇa and who attains it. Thus, nirvāṇa never ceases or comes to be, nor is it ever-lasting. Ultimately there is no transformation, neither the attainment nor non-attainment of absolute truth, nor anything or anyone to be perfected, for all being and becoming are negated.¹¹⁹

2.2 ADVAITA VEDĀNTA - ŚĀṆKARA

Śāṅkara's presentation of Advaita Vedānta¹²⁰ rests primarily on the tenet that brahman, ultimate reality, is the innermost self (ātman), pure, homogenous consciousness. As brahman, unconditioned absolute reality, alone is real, all characteristics of phenomenal existence are illusory impositions onto brahman. Ignorance of the true nature of absolute reality results in the appearance of the manifold world and attachment to it as genuinely existing. Śāṅkara discriminates the apparent from the absolute and discards it as unreal. Once the false impositions are removed from absolute reality, the liberating knowledge of brahman, the innermost self freely arises. This negation does not lead to mere naught, but is a means for realizing true self-knowledge. Knowledge of brahman is brahman, the absolute reality and ultimate freedom.

2.2.1 Absolute Reality and Illusory Appearance

Śāṅkara's teachings are called Advaita Vedānta. His basic tenet is that brahman alone is real. All is brahman, the one without a second.¹²¹ There is nothing outside of or different from brahman. The essence of reality is its unconditioned absoluteness. Brahman is existence-knowledge-bliss absolute. It is without attributes, difference or parts. Existence, knowledge and bliss are not qualities of brahman,

they are brahman, the indefinable and unthinkable ultimate. The central purpose of life is to realize that conditioned brahman, the ground of all existence, is identical with the innermost self at the core of every individual. Absolute reality is one, pure, homogenous consciousness.¹²²

Rooted in avidyā (ignorance) or māyā (the power of illusion), beginningless mutual superimposition (adhyāsa) conditions brahman as the cause of the appearance of the world, and imposes the world as effect on brahman. Thus, the world is erroneously viewed as absolutely real and brahman appears as multiplicity. Duality is an artificial construct and not an original fact of reality. From the standpoint of avidyā, the absence of knowledge, the multiple world appearances are concrete facts of existence. From the standpoint of brahman, perfect knowledge, the manifold world does not exist. All that exists is brahman.¹²³ Thus, the world is but brahman falsely viewed as multiplicity.

2.2.2 The Appearance of Phenomenal Existence

Since the differentiated world appears to truly exist to all lacking in true knowledge, Śāṅkara offers an explanation of its manifestation. But he qualifies all discussion of the world as only an intellectualization, a theoretical concession to those who hold manifestation as a fact, and without genuine truth.¹²⁴

Brahman, through association with māyā, the power of illusion, is conditioned as the cause of the phenomenal world so that to those in avidyā the indivisible brahman appears to transform itself into the

multiple individual existences of the world. Brahman, through the limitation imposed by avidyā, is the material and efficient cause of the appearance of the world. From brahman the world appears, in brahman the world exists and to brahman the world returns. The manifold world, as effect, is an illusory imposition on brahman, the cause. The sense of reality which the illusory world appearance carries is due to the erroneous attribution to it of the characteristics of brahman. Brahman is eternally infinite and unchanging, and can^{not} be the cause of the manifold world as the existence of the world is only apparent and not genuinely real. Brahman is not truly transformed into the phenomenal world, and the apparent manifestation of manifold existence does not affect brahman in its ultimate transcendence. However, the illusion of the world appearance is beginningless and is the universal error of those lacking true knowledge.

Māyā is the principle of illusion which conditions brahman as creator and is the power with which brahman is invested to account for phenomenal appearance. Māyā is the principle of creation as power (śakti), the power of nescience. It is the accessory cause of the appearance of the world as well as phenomenal creation itself, and thus is a potency which transforms itself into the world appearance.¹²⁶ Māyā's power is twofold. It acts as a concealing veil, where avidyā, though limited in nature, obstructs the intellect of the observer and conceals brahman's true unlimited and unconditioned nature. It also acts as a projecting power and creates the appearance of the phenomena of the world. The concealing and projecting powers of māyā work simultaneously, with projection due to the veil and the veil due to the

projection. The soul lacking in knowledge is unable to look beyond māyā.¹²⁷

World illusion is possible because brahman in its true nature is not known. Thus, the absolute, the one without a second, appears as relative diversity. Rooted in avidyā the everchanging and discrete forms of the world appear to have their own truth and reality. But it is only brahman, conditioned by association with the principle of illusion, māyā, which projects the false appearance of the world. Absolute, unconditioned brahman has nothing to do with world appearance.¹²⁸

Brahman, in association with cosmic māyā, appears as Īśvara, who possesses all the attributes of a personal god. In avidyā, brahman is conditioned and described in dualistic terminology. Thus, Īśvara is endowed with the highest qualities man knows in his ordinary working life, such as power, wisdom and mercy. Īśvara is described as the creator, preserver and destroyer of the universe. Conceiving the world in his mind, Īśvara projects the world, associating it with suitable forms, and thus creating a phenomenal existence of space and time, objects and subjects. For sport, Īśvara emits the world from himself and directs the play of the world. Although he is immanent in his works, Īśvara remains transcendent to the multiplicity of change and imperfection of the universe he has created.¹²⁹

Thus, Śaṅkara distinguishes higher, unconditioned brahman (nirguṇa brahman) from the lower, conditioned brahman (saguṇa brahman) or Īśvara. For those who are unable to grasp unaltered absolute truth, Śaṅkara supports approaching the impersonal absolute reality through a

personal god. This personal god is a symbolic reality and is described as possessing qualities to make him acceptable to the consciousness of those in avidyā. Devotion to Īśvara strengthens self-control and concentration, and is a step towards the ultimate knowledge of unconditioned brahman.¹³⁰

But devotion to Īśvara keeps the disciple bound in dualism and only true knowledge of unconditioned brahman can bring release from illusory world existence. As an aggregate of avidyā, Īśvara, the highest manifestation of relative existence, is only as real as the universe he creates, and lacks absolute reality.

Brahman in association with individual māyā, appears as jīva, the individual soul. In avidyā, brahman, the innermost self, is manifested as an individual which sees itself as separate from or as but a part of pure consciousness, through the obstruction of the true nature of the self. Oblivious of its ultimate nature, jīva identifies itself with the attributes of the ego, mind, senses and vital forces. From the perspective of empirical experience there exists a multiplication of jīvas, each resulting from associating the self with different attributes in avidyā.¹³¹ Each jīva is a subjective entity who perceived the phenomenal world as an external object. The individual jīva passes through diverse experiences in the manifest world, succumbing to the defects of desire and aversion. Conditioning the self as an agent and experiencer, the jīva accumulates the desirable, undesirable and mixed results of its actions, which in turn produce effects in the jīva's life when appropriate conditions arise. Once set in motion, this cycle is endless, for, as the fruit of some past action is spent, more is ac-

quired, with increasing momentum. Thus, the jīva, through attachment to the world of duality, becomes bound to the causally conditioned world of transmigration and its ceaseless suffering.¹³²

Believing itself in bondage, the jīva is a victim of its own illusions. The distinction between the self and jīvas is not real, and appears only in ignorance. The creation of multiple jīvas is like the creation of the manifold world, apparent only, and non-existent in absolute reality.¹³³

However, the soul that lacks true knowledge is unable to look beyond māyā, the veil that obscures the true nature of brahman. Thus, the diversified phenomenal world appears real and to exist separately from brahman. The individual believes that it is a distinct entity and bound to transmigratory existence. But manifold existence appears only through māyā in association with conditioned brahman, and therefore has no independent existence or reality. The world is an effect imposed onto brahman and is conceivable only in reference to brahman. Totally lacking self-identity, manifest phenomena have only relative, apparent existence. Creation and transmigration are illusory projections. Both Īśvara and jīvas are but apparent manifestations of brahman, pure consciousness. Although Īśvara and jīvas appear different due to avidyā, they are identical, and ultimately they are brahman, the innermost self.¹³⁴ Illusory manifold existence lasts as long as ignorance of brahman's true nature persists.

From the absolute perspective only unconditioned brahman, which is identical with the innermost self, is real. The world does not spring from brahman insofar as it is existence-knowledge-bliss absolute.

The one without a second cannot become many. Brahman is eternally infinite and unchanged, and is never really the cause of manifold existence. Thus, the world is not real and unreality is never born. There is no Īśvara or creation. There is no jīva or causal transmigration. Ultimately there is no illusory imposition on brahman, no conditioning and no māyā. Avidyā is not real. Brahman, the self, alone is real. Brahman is all that exists.¹³⁵

2.2.3 The Mutual Superimposition of the Self and the Non-Self

Śaṅkara elaborates on the appearance of the jīva, its properties and objects of its perceptions as distinguished from the self, which is identical to brahman. His discussion is of the apparent reflection of the self in the intellect by which all things are known and to which all things owe their existence.

The self, pure consciousness, is brahman and of the nature of eternal knowledge. Free from contact with anything and devoid of all phenomenal attributions, the self is eternally independent and contented, and immediately known. Always pure subject and never an object of knowledge, consciousness is ever self-illuminated, self-evident and self-existent.¹³⁶

In contrast, the non-self is all that appears as separate or as but a part of the self. It is the conglomerate of the intellect, the ego, the mind, the senses, the body, the vital forces and their properties - the aggregations of māyā. The non-self has no consciousness

of its own, being totally dependent on the reflection of the self, eternal knowledge, in the intellect for its consciousness and knowledge. All non-conscious things cannot illuminate themselves or each other. They can only be illumined by the self and thus depend on the self for their existence. Pervaded by the reflection of pure consciousness within it, the intellect assumes the forms of various objects, revealing their existence. The intellect is continually modified as it pervades objects one after another, revealing them and knowing them sequentially.¹³⁷ Thus, the awareness of all objects is mediately known, dependent on the intervening reflection of the self in the modifications of the intellect. The mutable non-self is always an object of consciousness, existing only for pure consciousness. Lacking independent existence and self-consciousness, the non-self is inseparably related to the self, its underlying principle.

While the self underlies and pervades all, it always remains pure consciousness and of a fundamentally different nature from that in which it is reflected. The self is never identified with the intellect, nor does it change with the modifications of the intellect. The pure self has no rest or motion. It is changeless and ever-existing.¹³⁸ Different than the combination of the intellect, the ego, the body and so on, it is free from contact with anything. The self exists for no other and is dependent on nothing for its existence. It is eternally self-existent, independent conscious being. Never an object of consciousness, pure consciousness needs no evidence to be known. Eternal knowledge itself, the self knows all simultaneously and is always directly known.¹³⁹

However, the soul in avidyā is unable to discriminate between the self and the non-self, and mutually superimposes the non-self and its impure, transitory qualities on the self and the pure eternal qualities of the self on the non-self. This beginningless, endless and erroneous mis-identification makes things appear as they are not and is the root of all illusion. The self, pure subject and eternal knowledge itself, and the non-self, the object of knowledge, are of such radically different natures that it is impossible to mistake one for the other, and yet it is the universal error of the deluded mind. Although this mutual superimposition is impossible from the standpoint of absolute reality, no phenomenal experience is possible without it.¹⁴⁰

Ignorance of the discrimination between the self and the non-self results in the superimposition of the non-self and its transitory qualities on the self, obstructing its nature as pure, limitless consciousness. Although the self is without attributes or parts, it appears to assume diverse forms due to connection with the unreal limiting adjuncts of avidyā. The non-relational self is related to the mind, the senses, the external world and so on. The properties of the intellect assumed by the reflection of the self within it are attributed to the self, with the predicates of knower, knowing and knowledge being falsely ascribed to the self. The self, eternal subject, appears as the object of knowledge, the individual perceiving consciousness or ego. The ego sees itself as separate from others and is the repository of numerous limitations and characteristics.¹⁴¹ In this erroneously imposed form, the self is seen as an agent and is connected with the varied experiences resulting from its actions. The self thus appears bound in

phenomenal existence through mis-identification with the non-self.¹⁴²

Avidyā also results in the superimposition of the qualities of the self on the non-self. Due to the proximity of the self through its reflection within it, the intellect appears conscious. The intellect is also falsely attributed with knowledge, although only the self is of the nature of true knowledge. Thus, the object of consciousness is confused with pure consciousness and erroneously endowed with independent self-existence.¹⁴³

The lack of discrimination between the self and the non-self is the cause of all misery and evil. In avidyā there arises an apparent dual world of multiple individual consciousnesses and their objects.¹⁴⁴ The individual consciousness desires the objects of its apparent consciousness. As the individual consciousness is an agent, this desire motivates it to action and the enjoyment of the fruit of its action, which in turn results in further action. The causal relation between the individual subject and its objects, between the agent and its actions, becomes an endless vicious circle of bondage and suffering.¹⁴⁵

The reflection of pure consciousness in the intellect, which is regarded as individual consciousness experiencing transmigratory existence, is due to ignorance of its true nature as eternal self. The duality of the individual consciousness and the objects of its perceptions is only apparent. The two do not exist independently, but are only made known through reference to the pure consciousness underlying both. The self-luminous self is the illuminator and perceiver of all phenomena through its reflection in the intellect. Only by being endowed with the reflection of the self within it is the intellect able to

transform into the forms of external objects and so reveal them. Thus, the intellect and all objects of consciousness are transitory, relative and dependent, and devoid of any genuine self-identity or reality. The beginningless mutual superimposition of the self and the non-self is impossible, as in absolute reality nothing exists but the eternal self, which is brahman.¹⁴⁶

The self is immutable, pure consciousness, without parts and predication. The self never really identified with the non-self. Its connections with limiting adjuncts are illusory for the self is devoid of contact with anything at all. It is free of knowing, action and experience, from transmigration and any relation with the diversified phenomenal world, and of superimposition and its root, avidyā, as they are all unreal. Nothing exists except the self, the one without a second, eternal knowledge. It is freedom itself and alone exists.¹⁴⁷

2.2.4 Māyā

Māyā prevents self-luminous brahman, the innermost self, from being known. As the projecting power of creation, māyā obstructs the true nature of brahman as eternal knowledge and makes things appear as they are not. Māyā is a positive principle as it produces and is the illusion of the manifold world.¹⁴⁸ Endowed with the quality of existence (sattva) it rests on pure consciousness and partakes in knowledge.

Yet māyā is an entirely dependent principle, being conceivable

only in reference to brahman and insufficient to account for the appearance of phenomenal existence alone. The various individual objects that exist in māyā are known only through the reflection of the self in the intellect, and thus have no independent self-existence. Absolute reality, unconditioned brahman alone exists and there can be no ignorance in pure consciousness, which is of the nature of eternal knowledge. Māyā has only apparent, temporary existence and dissolves when true knowledge dawns. It exists only as long as the intellect is deluded by it and thus cannot be real. However, māyā cannot be totally unreal, as it is a necessary postulate of phenomenal experience. It is inferred from the manner in which knowledge of objects is revealed in the intellect of the individual consciousness.¹⁴⁹

Thus, māyā is indefinite (ahirvacanīya), for it cannot be properly defined in positive or negative terms. It logically fails to describe the relation between brahman and the manifold world, and between the self and the non-self. This failure is due to the fact that no relation can exist between brahman, pure consciousness and eternal knowledge, and the object of consciousness, the manifold world, which appears only in ignorance.¹⁵⁰ Nevertheless, māyā is a necessary error. It is the means to brahman. Avidyā develops into vidya (knowledge) and thus is the condition needed to reach vidya. There is no salvation without sin. The negative is the condition of the positive. Thus, māyā is the hindrance and medium for the arising of true knowledge.

2.2.5 The Three Levels of Reality

Although Śaṅkara does not really admit division in reality, for the sake of convenience he speaks of three levels of reality. The first is pratibhāsika, the fictions which man encounters and sees through in his ordinary experiences in the world. The second is vyavahārika, the relative phenomenal existence of the soul in avidyā. The illusions of this stage are only removed with the realization of true knowledge. Paramārthika is the third and final stage. It is the absolute truth attributable to brahman alone. The distinction between these three truths is epistemological, their being different manners of apprehending reality. Brahman is unaffected by such distinctions, and from the absolute standpoint, such distinctions do not exist.¹⁵¹

2.2.6 The Three States of Consciousness

Partial data lead to partial knowledge, and only the whole of experience leads to perfect knowledge. Thus, Śaṅkara rejects no form of experience, and examines the three states of consciousness, waking, dream and deep sleep, which he states exhaust all the conditions of existence.¹⁵²

The waking state is the lowest stage of awareness. It is the state of the externally conscious individual who experiences external objects and becomes attached to them. In this state the intellect is transformed into the forms of objects and so reveals them. It is a

limited state of consciousness, being under the influence of ignorance, and it suffers and perishes with the physical body.¹⁵³

The dream state is the state of the internally conscious individual. In the dream state the modifications of the intellect do not assume the forms of external objects, but of their impressions only. Thus, the limits of the physical world are transcended and the mind is free to create and move within worlds where anything is possible. Yet the dream state remains a state of ignorance where happiness perishes and suffering persists.¹⁵⁴

The state of deep sleep is the primary state as it is the cause of the waking and dream states, and is the state of ignorance into which these two states of consciousness merge. In deep sleep the intellect ceases to operate and thus within it all objects of knowledge and their effects are non-existent. For this reason deep sleep is regarded as a state of unconsciousness. But unconsciousness is a notion formed in consciousness, which cannot conceive of its own absence. Therefore, even in deep sleep pure consciousness persists. Deep sleep is a state of undifferentiated bliss, but it lacks awareness of this unification and bliss and awareness of pure consciousness.¹⁵⁵

In relative consciousness, a false sense of reality is created and the claims of a given state of consciousness are accepted on its own pronouncements. However, although the objects of the dream state appear to be real while the dream persists, they are found to be illusory on waking. Similarly the objects of the waking state cannot survive an awakening from illusion and are finally discovered to be unreal. The state of deep sleep also lacks genuine awareness or real knowledge.¹⁵⁶

All three state of consciousness are illusory manifestations caused by avidyā. Each state is transitory, going out of existence as another state comes into existence. All three states are relative objects of knowledge superimposed on the self and thus dependent on the self for their existence. The self remains in its true nature of pure consciousness in all three states of consciousness. Ultimately it is radically different from and unaffected by the states of waking, dream and deep sleep.¹⁵⁷ From the perspective of relative consciousness, consciousness is transformed into three states. From the perspective of the absolute the three states of consciousness do not truly exist and pure consciousness is unchanging and undifferentiated.

2.2.7 The Negation of Erroneous Superimposition

Absolute reality is not attainable by the false knowledge of apparent phenomenal existence, but by taking it away. As the absolute is without characteristics and indefinite, it is better to indicate it through the removal of all attribution than to attempt a positive description. Rather than proving brahman is one, it is best to refute all present notions of brahman. A discrimination (viveka) of the real from the unreal results in the negation of all superimposition. Śāṅkara submits experience to a searching analysis to disclose its illusory nature, and thus enabling its negation and the realization of true knowledge.¹⁵⁸

All explanations of phenomenal existence procede from ignorance,

and are finally found to be contradictory and false. Even Śāṅkara's discussion of the appearance of the manifold world through brahman in association with māyā crumbles into indefiniteness. The enquiry into the cause of phenomenal existence inevitably ends in failure, for it is impossible for unreality to be born of reality and for the one, immutable brahman to become manifold, transitory, phenomena. The idea of causality is but the superimposition of avidyā and thus manifold existence must be negated from brahman. If the conditions appearing through avidyā are eliminated as unreal, the apparent duality of phenomenal experience ceases. Then only brahman remains, for brahman is all that exists.¹⁵⁹

To discriminate the true self, which is identical to brahman, from falsely superimposed adjuncts, the soul still bound by avidyā must negate what the self is not. All qualities erroneously superimposed on the self must be negated as not being the self's essential nature. All that is defined as the non-self, the intellect and the mind, the senses, the body, the vital forces and their properties, must be negated. Egoism and the idea of agency, the desire and aversion that leads to action, and the pain and pleasure that is the result of action, causality, duality and multiplicity - all are eradicated as not being pure consciousness. All concepts of the self are imaginations of the mind, obstacles due to ignorance, and not truly real. Even the predication of knowing applies only to the intellect with the reflection of the self in it, and not to the self. The duality of subject and object disappears when the mind ceases to act and it is realized that the self alone exists. The object of consciousness, the reflection of the self in the

intellect and even the process of superimposition must be negated as not truly applying to pure consciousness.¹⁶⁰

All that is negated is unreal, as only false reality can be negated. As that which is negated does not really exist, being illusion only, it does not really disappear. Once all false attribution is negated it is realized that these attributes are of the nature of brahman, for only brahman exists.¹⁶¹ When the process of negation is completed all that remains is brahman, the eternal self. The self is thus reduced to its original oneness, immutability and purity. That which truly exists can never be non-existent. So the self is not the result of negation, but is eternally present.¹⁶²

2.2.8 Absolute Knowledge

Once all false attributes are negated, all obstacles to self-realization are removed and immediate knowledge of the absolute identity of the self with brahman, existence-knowledge-bliss absolute, can arise. It is not enough to simply recognize the erroneous nature of all superimposition and negate it. The pull of transcendent knowledge of brahman is also necessary. The removal of ignorance and the arising of knowledge are simultaneous.¹⁶³

With absolute knowledge, all limitations and conditions, all individuality and difference, all superimposition and the entire diversity of phenomenal existence dissolves. Illusions cannot persist when the truth is known. Eternal knowledge destroys false knowledge and its

effects once and for all,¹⁶⁴ so that delusion can never recur. Once knowledge arises there can be no avidyā, for knowledge is completely incompatible with avidyā. There can be no avidyā in the self, which is of the nature of eternal knowledge itself.¹⁶⁵

Once knowledge of brahman is realized it is seen as self-evident. True knowledge depends on nothing else to establish it. It is not something that is acquired, but is a disclosing of what has always existed. Realizing self-luminous truth results in a permanent transformation. Eternal knowledge of brahman, the innermost self, is brahman.¹⁶⁶

2.2.9 The Utility of Relative Knowledge

Śaṅkara admits the necessity and utility of relative knowledge in the realm of ordinary experience, provided it has no absolute pretensions. Although the self-evident brahman is dependent on nothing for its illumination and is beyond the reach of words and thought, it is obscured by ignorance. Thus, for those bound in māyā, Śaṅkara provides an explanation of creation and a means of release from its bondage. Born into phenomenal existence, the soul suffering from ignorance must work through appearance to approach absolute reality. The positive evidence of scriptures and inference, as taught by an enlightened teacher, is necessary to point the way to direct experience of true knowledge.¹⁶⁷

The primary source of the knowledge Śaṅkara imparts is śruti,

the sacred scriptures, whose authority he stresses is unquestionable. Śaṅkara is primarily concerned with the Upaniṣads, the concluding chapters of the Vedas, the Hindu scriptures. The Upaniṣads are the basis of Vedānta. Śaṅkara follows the division of all śruti into two parts, the karma-kāṇḍa, or ritualistic portion, and the jñāna-kāṇḍa, a portion dealing with knowledge of brahman. He describes the distinction of karma-kāṇḍa and jñāna-kāṇḍa as minor and major texts respectively, stating each group offers different teachings suited to the different temperaments of seekers after truth. The minor texts view reality from the causal perspective and relate indirectly to brahman. They lead the aspirant through empirically experienced duality to meditation on the knowledge of non-dual reality. The major texts make duality impossible and lead to the immediate experience of non-dual brahman. Śaṅkara seeks to harmonize the scriptural statements with the experience and knowledge of those seeking true insight.¹⁶⁸

Śruti depends only on its own authority, but as long as the soul in avidyā is a slave to the rational and dualistic experience, the absolute self-sufficiency of śruti has little appeal. A rational explanation as a supplement to śruti is helpful in strengthening an understanding of the sacred texts. Thus, Śaṅkara expounds his philosophical explanations as a concession to those lacking in insight.¹⁶⁹ Although māyā is indefinite and logically fails to describe the appearance of the world, it is offered as an explanation of creation for those who hold creation to be a fact.

Inference is also used to repudiate wrong concepts so that those who aspire after liberation may be steady in the path of knowledge and

free from the doubts which may arise from hearing false doctrines. Attached to the conclusions arrived at by their own enquiries, dualists take their relative viewpoints as absolute truth. Inevitably disputing amongst themselves, these upholders of false doctrines mutually contradict and thus refute each other, thereby establishing Advaita or non-duality.¹⁷⁰ Śaṅkara claims Advaita is the supreme teaching as its inferences are in conformity with the Upaniṣads.

Right knowledge is the greatest secret of śruti since it cannot be realized without being taught by a teacher. Śruti can give information, but not inspiration, so a seeker after liberation must take refuge in a teacher.

"The teacher is one who is endowed with the power of furnishing arguments pro and con, of understanding questions and remembering them, who possesses tranquility, self-control, compassion and a desire to help others, who is versed in the scriptures and unattached to enjoyments both seen and unseen, who has renounced the means to all kinds of actions, who is a knower of Brahman and is established in it, who is never a transgressor of the rules of conduct, and who is devoid of shortcomings such as ostentation, pride, deceit, cunning, jugglery, jealousy, falsehood, egoism and attachment. He has the sole aim of helping others and a desire to impart the knowledge of Brahman only."¹⁷¹

The teacher, in his infinite grace, guides the earnest disciple to perfect knowledge.

A teacher must impart supreme knowledge only to one who has the true qualities of a disciple. The disciple must possess learning and be well-versed in the Vedas. He must possess self-control, tranquillity of mind and complete concentration. He must have dispassionately renounced all pleasures and withdrawn into the serenity of the self. He must be

able to discriminate between what is real and what is unreal. The disciple must possess humility and forbearance, and must be obedient to and have faith in this teacher. Finally, the disciple must have an irrepressible longing for the realization of absolute knowledge.¹⁷² Śaṅkara's teachings are for such spiritually advanced disciples who are on the verge of self-realization and who only need to hear and meditate on the highest teaching, that brahman is the self, to attain eternal knowledge.

Words and ideas, being limited and phenomenal, can only be applied directly to the intellect, the object of knowledge, and indirectly to the self, which is true knowledge and which cannot be denoted by any word or idea.¹⁷³ Nevertheless, Śaṅkara uses the teachings of the scriptures and inference, which are modifications of the intellect and must not be attributed to the self, as a medium for investigating truth. Although the intellect is an object of consciousness and has no hope of comprehending the self, pure consciousness, it can be used as an imperfect instrument to remove avidyā and point to true knowledge. As the intellect transforms into the object with which it is in contact to reveal it, so it is transformed into brahman-consciousness when instructed in right knowledge. Eternal knowledge may be dimly perceived before becoming completely clear, but it must always be total and never partial. Arising at first as a state of consciousness, true knowledge of brahman overwhelms the reflection of the self in the intellect, so that all that remains is self-brahman.¹⁷⁴ Ultimately all scriptural teachings and inference, all intellectual knowledge, must be transcended for the immediate experience of true knowledge. Śaṅkara's

path of self-realization destroys avidyā and leads to the direct realization of eternal knowledge as the self's true nature and as identical to brahman.

2.2.10 Avoiding Nihilism

However, the negation of the phenomenal experience in the quest for self realization does not lead to a fatal void. It is the mechanism for removing avidyā and not an end in itself. Negation has two facets. First of all, it indicates that absolute reality is attributeless and that any attempt to define it is doomed to failure. Secondly, it indicates that nothing exists outside brahman, that brahman is all-inclusive. The negation of avidyā leads to the positive apprehension of true knowledge of brahman, pure consciousness.¹⁷⁵

2.2.11 Brahman, the Eternal Self, True Knowledge

Śaṅkara does not try to prove that absolute reality is one or that the self is identical to brahman. He simply presents these statements as fundamental truths. His main purpose is not to explain the manifold world, but to explain it away. Thus, he discloses the falsity of existing notions of phenomenal experience through rigorous argumentation. It is easier to remove false knowledge through its negation than to attempt to put forth positive evidence. Once all erroneous

conceptions of reality are negated, true knowledge can be realized.

However, this negation leads to an affirmation. For Śaṅkara, brahman, the innermost self, is clearly a positive reality, and he does provide some positive characterizations of brahman. Brahman is free of limitation and duality, and without parts or multiplicity. Not related to anything, it is devoid of predication. Brahman is existence-knowledge-bliss absolute, which Śaṅkara stresses are not attributes of brahman, but its very essence. Brahman is infinite, pure being.¹⁷⁶

Brahman, the self, is all pervading. It persists in all manifold appearances and yet remains the same throughout. Immediate and ever-present, it manifests and maintains all objects, but is never an object of consciousness itself.¹⁷⁷

The self is the eternal witness of the various forms of phenomenal existence, but remains free of their defects. It is the witness of all existence and non-existence, and the witness of all change and superimposition. It is the witness of the states of waking, dream, and deep sleep that exhaust all conditions of experience. It is the witness of the negation of false adjuncts and the teaching of true knowledge. If a witness other than the self is presumed, an infinite regression results. Thus the immutable self has no other witness. The self, brahman, is the immutable essence of all.¹⁷⁸

Self-identical, self-subsistent and self-evident, the self is eternally contented. Nothing exists except the self, which is brahman, the one without a second. The eternal self is without beginning or end. It is serene, pure consciousness.¹⁷⁹

Eternal knowledge is eternally existent in the self. It is the

self's true nature. Thus, the self is the basis of all knowledge. Eternal knowledge has no object content. Pure consciousness is always immediately known and needs no other consciousness to be known. It is never an object of knowledge, neither of another consciousness nor of itself. The self is always naturally self-luminous. Eternal knowledge is not an attribute of the self, but its essence. Knowledge of the self is the self, brahman.¹⁸⁰

2.2.12 Liberation

Self-knowledge, the realization of the true nature of the innermost self is brahman, is eternally existing in the self. This eternal knowledge is eternally existing liberation. It is the supreme goal which destroys avidyā, the root of bondage to the transitory, manifold world, and once attained avidyā and its effects never again occur.¹⁸¹ Freedom is attained only through knowledge of brahman and is identity with brahman. Liberation is not a change of state or a product as the soul in avidyā falsely believes. If liberation were a change in existence it would be transitory and therefore artificial. Bondage is but a delusion, and once this delusion is removed, knowledge of the self as eternal and immutable liberation arises. Eternal knowledge has no connection with the ideas of acceptance or rejection. It is never known or unknown. It never goes out of existence nor comes into existence from previous non-existence. Ultimately there is no bondage or avidyā, no aspirant, no liberated soul and no liberation. The self is ever-

awakened, freedom itself. Liberation is always attained. The self-realization, which is liberation, is not of the ultimate, but is the ultimate.¹⁸² It is eternal knowledge, which is brahman, the self.

2.3 THE IMPORTANCE OF NĀGĀRJUNA'S AND ŚĀṆKARA'S TEACHINGS

The discussions of Nāgārjuna's and Śāṅkara's teachings have been presented so that the parallels between the two are clear. Both distinguish two fundamentally different manners of apprehending reality - conventional, conditioned knowledge and absolute knowledge. Ignorance of the true nature of the real results in conventional knowledge obscuring and distorting the absolutely real, causing the apparent existence of the phenomenal world. But a rigorous analysis uncovers the inherently dependent, contradictory and limited, and thus unreal nature of conventional existence and knowledge. Therefore, these illusory impositions are removed from the absolutely real, allowing transcendent intuition of absolute truth to freely arise. Both Nāgārjuna and Śāṅkara seek to arrive at fundamental meaning in life by providing a means to realize true knowledge, absolute spiritual freedom.

Nāgārjuna stresses the absolute negativism of all man's ordinary perceptions and conventional knowledge. He refuses to define the absolute in any manner, arguing that all such attempts to indicate the nature of absolute truth serve only to conceal it through illusory fabrications. He is so rigorous and consistent in his denial of all views of absolute truth that he can not be called dogmatic in any way.

He negates every statement that he makes, even his negation. Śaṅkara's presentation is perhaps more palatable to the unenlightened. He does provide an explanation of the appearance of the manifold world for ignorant souls, although he stresses its absolute unreality as anything other than brahman. His absolute knowledge is not as negative as Nāgārjuna's, as he stresses that the absolute, brahman, is the innermost self, knowledge-consciousness-bliss absolute. Although Śaṅkara stresses that these are not characterizations of brahman, but brahman itself, he is providing an indication of the absolute. He also adamantly states that brahman is identical to the self and that absolute reality is one, thereby presenting a view where Nāgārjuna totally denies all views.

The distinction between selective understandings of reality and the non-selective reality is illuminated by the lucid and concise distinction between conventional and absolute knowledge provided by Nāgārjuna and Śaṅkara. The inherent limitations of conditioned existence and the dangers of it attempting to usurp the absolute are clearly specified, and the absolute freedom of real truth is stressed.

The presentation of the inherently contradictory nature of all limited knowledge and the relativity and unsubstantiality of all physical existence, and thus the impossibility of a consistent and complete description of the physical world is particularly interesting for the discussions of the following chapters on the scientific method and modern physical theories. Neither Nāgārjuna nor Śaṅkara deny the utility of ordered descriptions of phenomenal experience in certain contexts, provided these descriptions are not seen as absolutely real. However, for both, the main purpose of discussing these descriptions is

to reveal their inherent limitation and ultimate unreality so as to free man from their confines to realize true meaning and his real potential - that is to enable the unfettered arising of absolute knowledge, which is genuine freedom.

3. SCIENTIFIC METHODOLOGY

Having examined two philosophical religious systems in some detail, science will now be investigated. Turning again to the western perspective, it will be disclosed how an awareness of the inherent limitations of selective views of reality as distinguished from the non-selective whole of reality informs an understanding of methodology. A great deal of extensive research has been undertaken in the field of methodology. The problems encountered in scientific methodology are of particular interest because they apply in more extreme ways to other fields of research which are not as clearly defined and which do not have as rigorous research techniques. The field of scientific methodology is vast and encompasses many divergent views. No attempt is made here to be exhaustive. The following presentation springs largely from Thomas Kuhn's discussion of scientific methodology.¹⁸³ The many complex issues of the field are simplified to present an introductory overview which fits the frame presented in this thesis.

Nāgārjuna and Śāṅkara disclose the contradictory and limited nature of all conventional knowledge and the impossibility of a complete and consistent description of the world as a means for attaining freedom from limitation. Science, however, seeks to uncover a coherent and meaningful order of the phenomenal world through a systematic methodology. The insights of Nāgārjuna and Śāṅkara should be kept in mind while examining the process through which science acquires knowledge,

the positivistic and purely relativistic misunderstandings of the scientific method and the usefulness, limitations and potential of science.

3.1 Scientific Paradigms

To examine some of the conditions making science possible, to examine its methodology, is to analyze the process by which paradigms develop and come to dominate scientific thought. A paradigm is the scientifically accepted pattern for perceiving and discussing phenomenal experience in terms of a specific overall order. Scientific models symbolically represent aspects of the world for specific purposes and inform the theories which explain the idealized behaviour of observable systems. Together, models, theories and empirical data form a paradigm, the generally "recognized scientific achievements which for a time provide model problems and solutions to a community of practitioners"¹⁸⁴. The paradigmatic quality of science's natural interpretations consciously and unconsciously inform science's understanding of the universe.¹⁸⁵

A paradigm is inextricably interwoven with the individual researcher and his community. A given paradigm is the reflection of the here and now consensus or prejudices of scientists and their milieu. Scientific knowledge is a consequence of prior agreements and is disclosed subject to constitutive interests of which there is often no explicit awareness. The common possessions of the practitioners of a discipline are the symbolic generalizations which function as parts of

its laws; the shared commitments to beliefs in particular models which provide the metaphors of the discipline and help to determine the explanation of solutions of problems; the values which determine the choices between ways of practicing a discipline; and, finally, the choice of exemplars or concrete problems which the discipline addresses. These presuppositions of a given paradigm are governed by the currently existing social norms. A paradigm is what the members of a disciplinary matrix at a given time share. It accounts for the fullness of their communication and the unanimity of their professional judgements. The common intuitions and metaphysical commitments of a group of scientists dictates the weltanschauung of their community.¹⁸⁶ A given paradigm freezes the shifting presuppositions of scientists and their cultural milieu, and temporarily reduces man's environment into a manageable, comprehensive and suitable order.

A specific paradigm governs the models and theories, the instruments, procedures and applications of science. It selects the problems to which the scientific community addresses itself, and determines the presuppositions which underlie and generate these problems. It also provides an evaluation of the kinds of solutions to these problems which are acceptable. The paradigm even determines the phenomenological field accessible to research at a given time, prejudicing the expectations and interpretations of observations.¹⁸⁷

Scientific education is a process of conditioning all scientific thinking to the existing paradigm. Students of science must learn their field by accepting the theories of the present paradigm on the authority of their teachers and textbooks as they do not have the competence to do

otherwise. Science is learned through practice rather than through the acquisition of the rules for its practice. However, practice examples and problems are solved according to pre-established procedures and interpretations. Science is bound to its history, and most scientific textbooks present the history of science as a linear cumulative process by implying all past scientific enterprise was striving for the present paradigm and by discarding scientific research which does not fit this cumulative perspective. As they are pedagogic vehicles for the perpetuation of the present paradigm, textbooks have to be rewritten in whole or part whenever scientific paradigms undergo a major change.¹⁸⁸

3.2 'Normal Science'

Most scientific research occurs in the context of fixed presuppositions. 'Normal science'¹⁸⁹ is a process of prediction; a puzzle solving activity in which the scientist relies on the existing paradigm to set the puzzle and limit the possible solutions. Only those puzzles are chosen for which it is thought the solution is known. The puzzles are solved according to pre-established criteria, with prior experience determining present experience. Thus, problems arise only in the context of specific presuppositions, with most of the details of their solution preknown and the expectation of resultant details even greater. The questions asked determine the answers. Only identifying objects, perceiving what is known to exist, has a role. The fascination of 'normal science' is the challenge of solving the puzzle. The criteria

by which a given solution is judged is not whether it is relevant or significant, but whether it works. The progress of 'normal science' is measured by the number of problems solved.¹⁹⁰

'Normal science' is comprised of loosely related competitive specialties which analyze the world into precise fragments.¹⁹¹ It is so engrossed in examining details that it ignores the greater whole. 'Normal science' is not explicitly conscious that it is dealing only with models of phenomenal experience and not primary experience.

Conformity to the rules of the existing paradigm becomes unconscious, so that contrary information does not make a connection. A rule without exception is not recognized as a rule. Any given paradigm is intolerant of any new theory that challenges its authority, and it limits possible data to only that which fits its criteria of significance. Thus, all novel ideas and data are rejected or not noticed, and creativity is repressed. 'Normal science' does not consider philosophical issues. ¹⁹² It is concerned mainly with forcing nature into the conceptual box of the existing paradigm.

3.3 The Positivistic Misunderstanding of the Scientific Method

From the standpoint of the philosophy of science, the uncritical view of the scientific method of 'normal science' is positivistic. Although in philosophical considerations of science positivism is most often associated with the various proponents of the mechanistic world view of classical physics as providing the final and complete de-

scription of the universe, it is used here in the broader sense of the fundamental mis-understanding of the scientific method that uncritically cuts off enquiry into the conditions surrounding the acquisition of scientific knowledge. The several schools of thought into which positivism is divided are not detailed here. Only the general attitudes which inform the positivistic view of the scientific method will be discussed.

The positivistic misunderstanding of science stands and falls with scientism, which reduces knowledge to what science can know through the empirical analytic method. Scientism has an unproblematic belief that it can describe the universe in a theoretical and lawful manner, and boasts a rational method that constructs and corroborates all its laws by precise rules. Convinced that its method is founded in pure reason, scientism harbours the illusion it provides immediate, objective knowledge of the phenomena of nature. Phenomenal experience is analyzed into separate elements of fixed natures, whose interactions can be directly determined and manipulated. Knowledge is regarded as information, and the universe as a totality of facts which behave in a predictable and lawful manner.¹⁹³

Positivistic science regards these facts as existing in themselves and as waiting to be discovered through careful observation and independent from the theories regarding them. Scientific knowledge is objective and unambiguous, and free from the knowing subject and his interests and values. The hypotheses that empirical science formulates correspond directly to these self-existent facts. Hypotheses are developed according to specific, rational rules. The certainty of system-

atic observations, which isolate aspects of the world for repeated testing, results in immediate, unbiased evidence supporting these hypotheses.¹⁹⁴ In this manner, all scientific knowledge is predicted and verified exactly.

Scientism thus believes its theories provide clear knowledge of the universe as it is in fact. Its precise, formalized language gives a literal, determinate description of natural processes. From its experiences with local phenomena, scientism extrapolates its analyses to universal validity. It also claims it will eventually be able to explain all phenomena without major modifications of its scientific principles. Regarding its method as enlightened, scientism suffers from the illusion of presenting final and complete knowledge.

Scientism is only interested in the efficient prediction and control of objectified natural processes. It subverts the relevance of its knowledge to the successful achievement of this purpose. Things are controlled and used without reflection on their essential nature or purpose. By progressively bringing nature under its dominance, it seeks to technically manipulate the material environment and thus ensure human survival.

Positivistic science severs interests from its knowledge and dissociates values from the facts it uncovers. It is not concerned with insight into the whole of life or the depth dimensions of existence. Rather, it reduces all qualitative values to quantitative facts. Regarding its method as intellectually detached and valuefree, it is unconditionally committed to pure theory. It brackets out and overlooks all aspects of life not amenable to technical utilization.¹⁹⁵

3.4 Scientific Ideology

Claiming its rational method as the only valid one for all realms of life, positivistic science declares an exclusive claim to genuine knowledge. Insisting its standards are necessary for truth, it reduces all knowledge to that acquired through the empirical analytic method. It presumes that scientific knowledge exhausts human interests and understanding, and, usurping other values of life, scientism reorganizes traditional structures according to scientific and technical standards and laws. Social norms are supplanted by scientific information and a scientific image of the world is held before man.¹⁹⁶ With its growing technical power, scientism seeks to control social life in the same manner as it manipulates the physical environment.

In its more radical forms, and when allied with power and industry, the positivistic misunderstanding of science reduces science to the tool of personal ambitions. Scientific knowledge is now the primary force of production, with manufacturing concerns focusing on technical information which brings nature into a form man can utilize for labour. It is the view of some people that labour thus becomes machinery and man is separated from the actual work process. Also, physical phenomena are viewed as commodities, with the capitalistic producer seeking the organization of society along strictly economic lines. Everything is viewed as objects for use or profit. With its vested interest, science becomes a force in preserving the status quo and an apologist for the existing social system. Knowledge is power, and the powerful knowledge of science can be used to develop society into a technocracy. When its

limitations and potentials are not correctly understood. 197

Once a system is rooted in man's way of life, it goes unnoticed. The permanent, regulated feedback is so overwhelming, the realm of possible experience is prejudiced. Under the influence of the positivistic misunderstanding of its method, science begins to circumscribe the entire culture and to be institutionalized in its social structures. In claiming its standards as necessary for truth, positivistic science is removed from the relativity of thought. It thus progresses as the necessary organizational form of a rational society. It facilitates the acceptance of technical structures through increasing reference to the neutral authority of science itself. Disguised as independent scientific common sense, self-legitimitizing scientism removes its standards from public questioning and critical reflection. With no genuine understanding of the involvement of science and technology in the environment and society, the public has no sense of personal responsibility for their effects. 198 In this manner the positivistic dogma of scientism's belief in itself becomes the dominating ideology of society.

3.5 Critique of The Positivistic Misunderstanding of the Scientific Method

The success of the empirical-analytic method of detailing the laws of nature has given it a false impression of excellence. Misunderstanding the role of paradigms, it does not seem as vehicles for comprehending nature, but mistakes them for literal descriptions of nature. Thus, a paradigm acquires a reality of its own, with little reference to

actual reality.

It is naive to assume that the universe is organized precisely according to the articulated laws of science. Scientific knowledge can be considered as only well-tried hypotheses which are subject to possible falsification at a later date. The exact repeatability of experiments is not certain, for time may enter experiments as an uncontrollable variable. Instruments are never perfect and may provide imprecise or erroneous results. In addition, there are various ways in which experimental results may be interpreted. There are no bare facts, rather facts are always inseparably linked to theories. The meaning and validity of empirical statements are pre-established and prejudiced according to the norms of the scientist's milieu. Science is a human endeavour, with the scientist living in the world as one of its parts and influencing the object of his study, making pure objectivity impossible. Scientific concepts are always approximations, with the scientist idealizing the images received from observations. The complex history of science discredits the purely rational method of scientism. Positivism ignores faulty theories and human error, and the fact that all human knowledge is disclosed according to interests and prejudices.¹⁹⁹

Although declaring decisions and standards to be meaningless, scientism advocates the criteria of pure rationality and value freedom, and determines what constitutes good scientific technique. As scientism denies it contains value judgments, the decisions it does make are arrived at arbitrarily and uncritically.²⁰⁰ Thus, the idealized empirical method of positivistic science is neither desirable nor possible.

Positivistic science tends to see its rational order as permanent. But despite the rigidity of the positivistic tendencies of 'normal science', scientific theories are continually shifting with man's changing experience and insights. New developments in technology, new observational data, either from new experimental procedures or accidental discovery, new theories and models and changing attitudes to nature necessitate a constant re-interpretation of physical phenomena. Scientific statements are provisional and incomplete, and always subject to change.

3.6 Scientific Change

'Normal science' clings to the established paradigm, attempting to suppress novelty and being intolerant of any new theory which may challenge the authority of existing structures. It does so by only selecting problems with a solution in the context of the paradigm. The greatest emphasis is placed on the capacity of adaption within a paradigm, which enables an adjustment of theories without a fundamental change in the established underlying notions of order. When new experiences impinge, a re-arrangement of existing images is sought. In certain contexts accomodation is adequate, allowing gradual change.²⁰¹

However, sometimes anomalous phenomena or problems emerge which cannot be dealt with by the established theories and procedures, or by simple adaption within the existing paradigm. An anomaly emerges only with difficulty, for first a scientist must see that something is, then

discover what it is to become aware that an anomaly exists. An anomaly must be identified, subsumed under a concept and related with all the concepts and information available, before questions can be asked about it. Once an explanation has become implicit, contrary information has difficulty making a connection. Familiar ways of viewing the world have high psychological value and emotional investment, and any deviance threatens these entrenched ideas and expectations. There is something so compelling about an initial premise, even in the context of disinformation, that there is a preference to distort the incoming information, rather than sacrifice the existing solutions. It is hard to question laws while standing in them. An anomaly is uncovered only by pursuing thoughts not permitted by the existing paradigm. Overcoming basic prejudices to recognize dissonant phenomena necessitates challenging ideas never before challenged and a fundamental shift in perception.²⁰²

When accommodation is no longer adequate, a fresh perception of the whole world order is required. When a significant anomaly does emerge, it points to inherent problems in the old way of thinking, forcing a paradigm shift. This shift often takes the form of a scientific revolution, since the normal scientific community is usually too rigid to change its underlying order until a crisis demands it. A crisis blurs the boundaries of the paradigm and loosens the rules of ordinary research, allowing dissension in parts and provoking fundamental philosophical questioning. Fractures in existing structures challenges scientists to discover new creative insights into the relationships of physical phenomena. A paradigm shift requires a change in

perception, an escape from entrenched presuppositions through a fundamental intuition to a new integration of images. The implicit insight thus formed is made explicit by the articulation of a new order through discursive thought and language.²⁰³

A given paradigm is frequently retained even when it is known that it is inadequate, for a paradigm can only be rejected if an alternative is accepted simultaneously, since there can be no normal scientific activity in the absence of a guiding paradigm. In a paradigm shift a whole new network of theories and experiments, instruments and procedures, and vocabulary and observed data emerges with the new paradigm. The problems and solutions, the rational interpretations and the entire process of normal science are restructured with the perception of a new order.²⁰⁴

3.7 The Pluralistic Method

However, the consequences of a new understanding of order must be thought out. It takes time for a new paradigm to develop its theories, to be supported by empirical evidence and auxiliary fields and to become relevant and applicable and to be detailed in specific forms which can be utilized by normal scientific research. In the beginning, connections with the previous concepts and modes of thinking cannot be avoided as new forms have yet to be developed. The new paradigm can only be judged by new sets of criteria and empirical tests, which may be unknown at first. Old facts must be reinterpreted. At first the exis-

ting language forms patterned on the old paradigm must be retained as new forms do not exist. These must be utilized in unusual and distorted ways to express the novel ideas, until a new vocabulary can be developed to fit the new situation.²⁰⁵ A paradigm is coherent and reasonable only after being in use for a period of time.

Thus, a breathing space is required during which critical phenomena are largely ignored and ambiguity is tolerated. While the new paradigm is developing it is necessary to step back from comprehensive and rational procedures, and allow ad hoc hypotheses and approximations.

Even once a new paradigm has been clearly elaborated and articulated, it is not readily understandable to those who do not share its presuppositions. Scientists with different theory commitments have different perceptions of the same phenomena and different solutions to similar problems. Much language and logic are paradigm dependent. Thus, there is difficulty in communicating between paradigms and a given paradigm is not logically compelling to those outside of its frame. In debates between proponents of competing paradigms, each group uses the presuppositions of its own paradigm to argue in its defence, so that the opposing groups often talk past each other and become ensnarled in circular arguments. The result is that persuasion, coercion and propaganda, instead of reasoning, are frequently resorted to in order to convert scientists to a new paradigm.²⁰⁶ However, a new scientific truth does not usually triumph by convincing its opponents and making them see the light, but because its opponents eventually die and a new generation of scientists grow up that are familiar with it.²⁰⁷

A pluralistic method is necessary to keep science open and

critical. It allows the scientist to step outside of well established rules, categories and constrictions, and to be free and innovative. The pursuit of many avenues of thought should be tolerated as it cannot be known beforehand which will prove to be the most coherent. Scientists should be allowed to step outside the existing paradigm and to introduce counter inductive hypotheses inconsistent with the existing theories and experimental data. New data introduced by ad hoc connections should be permitted. Allowing a degree of indetermination enables science to develop, adjust and evolve. What appears as nonsense today may become significant in the future. New ways of observing problems can be suggested by transferring the features of other situations better understood. The whole of human thought and activity, affects scientific achievements in various and subtle ways, assisting its development. Bringing together a variety of perspectives and unusual and miscellaneous information, and allowing an unmethodical and unreasonable foreplay stimulates creative insight into new orders.²⁰⁸

3.8 The Relativistic Misunderstanding of the Scientific Method

An awareness of the prejudiced order a paradigm presents, and of the irrational nature of scientific development is necessary to avoid the naive and idealistic notion of the scientific method of which positivism is guilty. Arising from this awareness is the radical viewpoint, opposing the extreme attitude of positivism, that scientific knowledge is purely temporary and relative. This view sees any given paradigm as restricted to being merely the most logically consistent of the number of known possibilities in a particular historical situation, not providing any genuine insight into natural processes, and to be replaced as soon as a better paradigm is found. Pure relativism stresses that all paradigms are totally incommensurable in a manner parallel to the different perceptual modes of diverse cultures. Thus, there are no neutral languages or arguments, no overarching standards by which to compare different paradigms. Personal judgments, values, interests and prejudices alone determine the decision to accept a given paradigm. A scientist is not rationally convinced of the value of a given paradigm, but is converted to the belief system of that paradigm. In this view science is confined to the progression of a series of closed systems, with no movement to genuine truth. In its most extreme form the relativistic view of science claims that the only true scientific method is anarchism, and the only rule to which science should adhere to is the rule that no rule should not be broken. Any idea, whether invented or imparted from another discipline can improve science. 'Anything goes!' Stepping back from comprehensibility and

into chaos is necessary for knowledge and free progress.²⁰⁹

3.9 Critique of the Relativistic Misunderstanding of the Scientific Method

However, such total relativism is meaningless and impossible. An anarchistic method is still a method. The rule 'anything goes' is just another rule. Simply denouncing it does not provide genuine freedom from a rational methodology. Even a self-proclaimed anarchistic scientist has had training and is prejudiced by the presuppositions of his worldview, and thus cannot be truly random and irrational in his judgments and decisions. Any attempt to pursue an anarchistic methodology would cause science to degenerate into an elaboration of the personal fantasies of individual scientists.

Although there are no explicit rules for a choice between paradigms, there are independent criteria, shared reasons and values. General judgments as to the simplicity, accuracy, applicability, coherence and elegance of theories are used to determine their worth. Aesthetic perception of the harmony of structure of the theory and between theory and fact, and effective achievement of purpose are further criteria. A theory can also be falsified through empirical testing. There are usually some overlapping concepts and terminology, and jointly identifiable phenomena between paradigms. It is possible to discover how two paradigms differ, translate between their divergent perspectives, and make a decision as to which is the most appropriate in

the given context. The old paradigm is often still valid as an aspect or condition of the new paradigm.²¹⁰

Arbitrary change leads to confusion and thus most paradigm shifts are limited to clearly defined problems in the context of the whole body of knowledge.²¹¹ Science is not a purely relative enterprise reduced to the philosophy of 'anything goes' or to a series of closed systems with no progression in its understanding of nature. For science to be free and creative, it is not necessary for it to relinquish all order, only the dogmatic and uncritical domination of a particular order, an error of which the positivistic misunderstanding of the scientific method is guilty. Neither purely rational, empirical and deterministic, nor irrational, subjective and anarchistic, science provides explanations of aspects of reality with inherent limitations and values.

3.10 The Limitations and Values of Science

Science, conscious of the limitations of its methodology and knowledge, is a worthwhile enterprise. Science deals with abstractions, approximations and idealizations. By concentrating attention on certain portions of man's experience and simplifying the vast amount of influxing information regarding physical phenomena, its analyses provide limited explanations of aspects of greater systems. Science successfully introduces order and regularity into the wealth of heterogeneous experiences, reducing them to manageable bits which are predictable,

comprehensive and dependable. Its process of constructing interpretive frames for understanding nature is consistent with the human task of finding meaning and his place in the world.²¹² Man cannot ignore the physical environment in which he finds himself. The cosmology presented by science makes this environment more understandable and less threatening.

Science is very clear and successful in certain domains. Scientific knowledge has many practical applications and much can be learned by exploring the implications of a given paradigm. The empirical method is a highly sophisticated and useful means of interacting with the environment. Scientific technology has vastly improved the physical capabilities, health and wealth of man. It has made the natural world a less hostile environment, and in many ways ensures man's survival.²¹³ Indeed, science and technology are now necessary components of modern civilization.

Accepting the order science presents enables action and the pursuit of other dimensions of human experience without constant thought about interaction with the physical world. Science is a vital and efficacious component of human understanding, provided it is not seen as providing final and absolute answers.

Some scientists seek a final explanation which will encompass all natural phenomena. However, articulated insights are not totally relevant indefinitely. Man's attitude to nature is continually shifting, making given scientific conceptions of natural phenomena provisional. Statements which are the most complete that can be made in a given context, often become inadequate as man's experience and under-

standing change. Scientific order is time bound and only valid for delimited areas of experience. Thus, science needs to promote tolerance and change if it is to survive and remain relevant. Science should not become too rigid, nor should it relinquish its sense of structure.

Science may move to continually new levels of knowledge, and even qualitatively new kinds of insight, but it still remains in the realm of conditioned, phenomenal existence. Science cannot achieve an articulated order which encompasses all of existence. Its theories represent abstracted aspects of experience, relevant in delimited contexts. Intuitions into the vaster whole can only be experienced, not expressed. Science does not provide a literal description of natural processes. Rather it presents a picture of man's relationship to nature. Science is a human activity. Its images are developed by man, and the scientist is a part of the phenomenal field he is studying. The object of scientific research is not nature in itself, but rather nature exposed to man's questioning, his knowledge of the phenomena of nature.²¹⁴ They are symbolic, interpretive frames for understanding phenomenal experience which describe and relate abstractions from a greater whole and contradictions arise if they are applied formally.

Science is continually asking questions and probing into physical phenomena. But scientific development usually leads to more questions than answers. There is always a chasm between the order science discerns and nature itself with its many facets science has yet to discover and explore. There are also many dimensions of experience beyond science's scope. The gap between what science knows and the potential for understanding results in a tension and a thirst for know-

ledge.²¹⁵ An understanding and acceptance of this gap can be a stabilizing force around which science can orientate itself. Science should not positivistically seek to capture the whole of experience in the limited orders it discerns. Rather, it should accept its role as a constructive questioning activity, with inherent limitations.

Science is a suitable enterprise only for certain delimited areas of experience. There are questions it cannot ask and still remain a scientific discipline. Science must also recognize the impingement on it of other facets of experience. The whole history of human thought and experience affects its achievements in various and subtle ways making the scientific method a complex process. Science provides only one way of knowing in a wider truth. It can move to the border of its limited knowledge, but not beyond. However, the limitations of a particular form of human knowledge is not the limitation of human knowledge as such.²¹⁶ There are certain critical limits of complexity, which, once attained, lead to new experience which is discontinuous and not predictable from former experience. To truly understand science's view of the universe and be aware of all its limitations, it is necessary to stand outside of it, in a deeper level of insight.²¹⁷

Abstractions have no significance when they are considered autonomous. Any phenomenon is truly understood only through its relationship with the whole of experience. For science to have genuine meaning, it must have an orientation beyond itself in a more encompassing whole. All relative symbolisms presuppose an absolute as the focus to which they all point.

Nature is not merely a development of man. There is a reality

into which science provides limited insight, and thus scientific theories can be confirmed by empirical experience. Informed intuitions of wider connections are often the creative centre of science, providing the essential ideas which 'normal science' then elaborates in detail. How science relates to the whole of reality must be continually queried, for it is the criteria by which to establish the genuine worth of science. To go beyond science, it is not enough to simply recognize its inherent limitations. An awareness of the whole is also necessary.

Neither absolutely true nor absolutely false, science does disclose some significant knowledge. It is a limited yet valid form of knowing, provided it avoids the extremes of positivism and relativism, and maintains an awareness of the larger whole beyond its scope. Commitment to a paradigm enables the acquisition of knowledge of physical phenomena, the development of powerful technologies and the achievement of purposeful action. Scientific ideas can be utilized without abandoning an awareness of their limitations.

Good science is tolerant and tentative. It is open for revision and grows with man's changing experience. Creative science is dynamic and flexible. To recognize the value of scientific knowledge, it is necessary to be aware of the conditions making it possible. Conscious application and understanding of its methodology keeps science self-critical. With its increased knowledge and technological advances, science unleashes powerful forces. With this power comes the temptation to utilize it in selfish or destructive ways. Responsible scientists alert society as to the implications of scientific advances and assist in applying them wisely. The genuine scientist seeks to understand

reality and uncover truth.²¹⁸ Good science balances an awareness of its limitations, with an exploration of its potential, in the context of the greater whole. From such a perspective it can confront the issues and problems of modern culture and assist in providing meaning in the life of the peoples of that culture.

4. MODERN PHYSICS

In the past science's presentation of physical order has tended to be based on the commonsense view of natural phenomena prevalent at a given time, the two continually interacting and shifting together. This correlation was certainly the case with the physical order presented by classical physics. However, the theories being developed and the phenomena being uncovered by modern physics, and their interpretation by physicists, are increasingly departing from the comfortable simplicity and familiarity of the commonsense view of his environment with which man operates in his daily life. The emerging representations of the physical universe raise fundamental questions about the nature of science, the manner of its knowing and the value of the knowledge it discloses.

4.1 MODERN PHYSICAL THEORIES

4.1.1 Classical Physics

Classical physics provides precise empirical knowledge of the dualistically experienced physical world. Its analyses disclose a universe composed of a multiplicity of disparate entities interacting

deterministically. These interactions are predictable and can be formulated in precise mathematical forms. The cosmic laws of classical physics simply provide a more detailed explanation of man's ordinary interactions with his physical environment.²¹⁹

4.1.2 The Theory of Relativity

Physics first real movement away from the classical world order, with its sensible description of the universe occurred with Einstein's theory of relativity.²²⁰

The theory of relativity states that the perception of order in the universe is relative to the speed of the co-ordinate frame of an observer. Space and time are no longer absolute, but are now dependent on an observer's perspective. Thus, the universe appears different for different observers. The only absolute is the speed of light, a fixed value that is unaffected by the relative velocity of an observer and to which all space and time is relative.

The special theory of relativity is concerned with reference frames moving with a uniform velocity relative to an observed object or event. Under these conditions length is found to contract and time to dilate. These effects become increasingly significant as the relative velocity of an observer's frame of reference approaches the speed of light. Transformation equations are needed to translate physical laws between relative frames of reference. Special relativity describes a higher degree of order than classical physics, integrating space and

time into a four dimensional continuum. Also mass is disclosed as a form of energy in Einstein's famous equation $E = mc^2$.

A four dimensional universe in which length contracts and time dilates is paradoxical for man's ordinary understanding of his environment. Especially perplexing is the paradoxical nature of time posed by special relativity. If an individual were to go on a trip, travelling at close to the speed of light, on his return he would find the friends he left behind to have aged considerably more than he has aged. Time would have slowed down for him relative to the time his friends experienced. An astronomer examining the information carried by electro-magnetic radiation from distant parts of the universe is actually observing the past. Physical experiments are no longer simply repeatable, for time is no longer a constant, but is now a variable which is different in different experimental contexts. These physical phenomena are alien to man's ordinary experience.

The general theory of relativity describes a physical order valid for all reference frames; those moving at both uniform and non-uniform velocities relative to the observed event. Leaving the Euclidean geometry of classical physics and man's primary conception of space and time, general relativity introduces a curvilinear order. The structure of the four dimensional space-time continuum is its geometry. The curvature of space-time is caused by the gravitational fields of massive bodies. Matter, and its gravitational field, is the curvature of space-time. Objects travelling through space-time take the most efficient path, the geodesic, and thus move according to the structure of space-time not due to the effect of forces acting on them.

Variations between different frames of reference are explicable by gravity, the curvature of space-time, which is indistinguishable from uniform acceleration. Space-time is no longer simply the stage of physical events, but is now a participant.

General relativity details the structure of space-time through non-linear equations which prevent the analysis of the world into separate yet interacting elements. It discusses localized structures as events or patterns of movement rather than as rigid bodies or point particles. It is a description of a closed model of the universe and diverse theories of the contraction and expansion, and the origin and end of the universe have arisen from its equations.

4.1.3 Quantum Theory

The physical description of the universe takes an even more startling departure from man's commonsense experience with quantum theory.²²¹

Quantum mechanics discloses the properties of matter through probability waves. The wave equation of matter is a well defined mathematical structure which enables the calculation of the probable outcome of a given physical experimental arrangement. It cannot predict what will actually happen in a specific event. The wave equation is only a probability measure for the actualization of different potentials in a statistical ensemble of similar observations carried out under specific conditions. Thus, subatomic particles are known only as

mathematical formulizations. These formulas determine the probable behaviour of particles, not the actual properties of an individual particle. A single particle is described as a tendency to exist and its path is called a probability orbit. The details of its path and its properties cannot be established through quantum theory. Thus, the characteristics of matter become statistically revealed potentials.

The wave equation describes a system with the possibility of being in all possible states. Upon observation one possibility actualizes. A perplexing paradox arises when the equation predicts two equally probable outcomes for a single experimental situation. In which state does the system exist prior to perception? Or does only perception lead to the actualization of a single state?

The wave equation of an observed particle cannot be specified apart from the overall experimental conditions set up to observe the particle. These experimental conditions ultimately extend to the entire universe. The form of the experimental conditions and the meaning of the experimental results are one whole, in which analysis into autonomously existing elements is not relevant. As the observer alters the observed by the act of observation, he must be included as a part of the experimental arrangement. The observer cannot obtain a true picture of the perceived as he changes the observational field in the act of observing. Only in interaction with the measuring apparatus is the behaviour of a particle disclosed, making events or interrelationships the fundamental observation. Discussions of particles as existing in themselves are no longer meaningful. The physical world is not independent of the manner of its apprehension. The concept of

independently existing objects is only an idealization, an abstraction from a more fundamental whole.

Quantum theory is limited by a basic uncertainty wherein an observer can gain information about a physical system through measurement only at the price of a complementary piece of information. Neither time and energy, nor position and momentum, can be measured simultaneously with precision. In addition, depending on the experimental conditions an experimenter arranges, light, or matter, will disclose either wave or particle behaviour, distinct properties that are not definable simultaneously. The same entity discloses two states, responding as a wave or as a particle, depending on the physical questions asked by an experimenter. Thus, quantum theory placed limitations on physical concepts being precisely formulated.

A necessary conclusion of present quantum theory is that events separated in space are directly correlated in ways incapable of detailed causal explanation. In violation of the theory of relativity, which restricts causal relations to the speed of light, distant systems appear to communicate without transmitting information in such a restricted manner. The observation of a particle, which results in an alteration of its state, results in an instantaneous alteration in the state of a distant particle, which was formerly in contact with the first. In addition, the movement of an electron between the standing wave patterns of its stationary states in an atom is a discrete, unanalyzable quantum leap. Thus, a detailed description of the movement of a particle, or the interaction between particles is not possible in quantum theory.

Quantum theory challenges man's ordinary experience of his environment and introduces an indeterministic and perplexing representation of physical phenomena. Chance has entered the realm of physical laws. The situation is aggravated by the necessity of communicating the indeterministic and non-dualistic behaviour of quantum phenomena with the deterministic and dualistic language of classical physics. Quantum theory places an inherent limitation on man's ability to know the physical world with precision. It is only a mathematical formulization, an abstraction or idealization, which requires interpretation to become meaningful for man's worldview.

4.1.4 The Particle Zoo

In the period following the introduction of relativity and quantum theory, physicists have found that physical experiments and laws are disclosing increasingly enigmatic phenomena. Experiments in high energy collisions of subatomic particles have resulted in a veritable explosion of particles.²²² The experiments are not disclosing the fundamental building blocks of matter, but a complexity of creation and destruction. The particles created in these collisions are not fractions of the original particles collided, but creations from their kinetic energy and mass. Many of these newly created particles are highly unstable, manifesting only momentarily in the explosion of energy and matter these collisions induce. The more the freedom of movement of a single particle is limited, the more quickly it moves around its

confined space, giving the appearance of solid substance. Thus, particles appear to be bundles of energy or processes moving at high velocities.

The uncertainty of measurement in quantum theory allows even free particles, that is those particles not in interaction with other particles, to emit particles, provided they are reabsorbed after a brief interval of time, without violating any physical laws, such as the conservation of energy or momentum. Free particles do not have an excess of kinetic energy which can be utilized to emit independent particles. Rather, they momentarily transform into different particles in what is known as a virtual process. These transient or virtual particles emit their own virtual particles, so that a single particle can be regarded as a fuzzy cloud of virtual particles, a continual process of self-interaction.

Forces between particles are explicable by the exchange of virtual particles conforming to the uncertainty principle. Electromagnetic force is weak, yet has an enormous range, as the virtual particles comprising it have a minimal energy and thus can exist for relatively long intervals of time. Nuclear force is very strong, yet very short range, as the virtual particles comprising it have high energy and thus a very short life span.

Each particle is continually generating other particles which are generating it, so that any given particle is simply the intermediary of the complex of interactions. All particles exist potentially as different combinations of other particles in a constant emission and

absorption of virtual particles, resulting in the interpenetration and interdependence of all particles.

Even empty space can provide particles out of what is apparently nothing, provided the existence of these phantom particles is extremely short. Seemingly empty space is a field of endless creative potential, capable of manifesting particles of all possible energies and momentums. The field of the whole universe is the primary description, the potential of all forms, with particles existing as abstractions, localizations of the field or concentrations of energy. The field and the particle do not exist autonomously, but are inseparably interwoven. As distances become smaller, the total energy of this vast fluctuating background of creation and destruction approaches infinity.

The emerging image is of a restless, effervescent, interdependent and powerful universe. There is no localization of physical events, rather each part interacts with all other parts. The universe appears as a dynamic web of interrelated and interdependent events, with no part necessarily more fundamental.

4.1.5 Conclusion

Certain regularities have been discerned by some physicists in this highly complex and unsettling scenario. Particles and their interactions have been grouped into families structured by the rules of the various conservation laws of physics. Matrices have been developed to specify the initial and resultant conditions of particle

interactions. Attempts have been made to represent the general symmetry properties of the universe through field equations. Quarks have been proposed as the fundamental building blocks of elementary particles with some success.

The above discussion does not cover the entire gamut of theories developed and being developed in modern physics. It is simply a concise examination of those theories most relevant to the thesis being presented. As yet there is no generally accepted, consistent and comprehensive explanation in physics for the strange world its mathematical formulas and experiments are disclosing. Physicists are not in general agreement as to the direction physics should take to meaningfully integrate all modern physical phenomena into a comprehensive order.

4.2 INTERPRETATIONS OF MODERN PHYSICS

In physics, mathematical formulas and experimental observations cannot be separated from their interpretations and explanations, the theories which together provide a meaningful order by which the physical universe can be understood. Even more unsettling than the bizarre phenomena modern physics is uncovering are the different interpretations physicists give of these phenomena and of the future course of physics. Intertwined with these interpretations are presuppositions about the value of scientific knowledge and the methodology by which such knowledge is uncovered.

4.2.1 The Probability Function

Some of the greatest debates in modern physics centre on the meaning of the probability wave equation of quantum mechanics. In statistics, probability functions are only mathematical models facilitating the analysis of large groups of data. The concept of probability was not originally intended to be logically applicable to concrete physical systems.²²³ However, as the probability equation is the only existing successful means for calculating in detail the behaviour of the subatomic world, and as it can only describe this behaviour in terms of statistically revealed potentials, some physicists declare nature to be fundamentally indeterminate. Chance irregularity and uncertainty are seen as primary experiences. Erwin Schroedinger, the physicist who first formulated the wave equation of matter, states; "We sorely need those spherical waves as realities ... there are many experiments which we simply cannot account for without taking the wave to be a wave, acting simultaneously throughout the region over which it spreads ... "²²⁴ Thus, some physicists directly contravene the assumptions under which probability theory was derived, and assert that probability waves correspond directly to the physical phenomena of atomic and subatomic processes.²²⁵

4.2.2 The Copenhagen Group

A group of physicists meeting in Copenhagen during the early days of quantum theory came to the conclusion that the wave equation does not directly represent physical phenomena. It is simply an algorithm for making statistical predictions. The uncertainty principle indicates the limits of physical concepts being placed in precise mathematical form. This limitation does not denote ignorance on the part of physicists. Rather, it discloses an inherent barrier to precise descriptions of natural phenomena. Quantum mechanics is the best description physics can provide, and the Copenhagen group of physicists are satisfied with the way it correlates physical phenomena. A more complete understanding of the universe lies beyond rational, scientific thought.²²⁶

Niels Bohr is the central physicist of the Copenhagen group. He declares that the results of experiments in quantum mechanics can only be described in terms of the concepts of classical physics, making complementarity necessary for a full description. Both the wave and particle are needed for a complete picture of the phenomena observed, and yet both cannot be defined simultaneously and precisely. The only solution is to accept complementarity as fundamental.²²⁷

4.2.3 Heisenberg

Werner Heisenberg's interpretation of quantum mechanics arises to a large extent out of his discussions with Niels Bohr and the other physicists meeting in Copenhagen. He also claims that the uncertainty inherent in quantum theory is a natural barrier to physical descriptions. Quantum mechanics can only provide indirect knowledge of the behaviour of subatomic particles, but there is no known language with which to speak more precisely of physical processes. Although it is not fully understandable, quantum mechanics works and is complete in the sense that through it physicists know all they can of atomic phenomena.

Heisenberg feels that the uncertainty inherent in quantum theory calls for abandoning the search for fundamental particles and advocates focussing attention on representing the phenomena uncovered by quantum theory through matrices instead. Matrices do not specify what happens during atomic and subatomic interactions, rather only the patterns of initial and resultant conditions. The symmetries of nature represented in such physical models are more fundamental than particles.

Heisenberg states that modern physics does not study nature in itself, but only man's knowledge of nature. It no longer provides a picture of nature, but rather a picture of man's relationship to nature. However, although physics may be the limit of certain forms of human activity, it is not the limit of human activity as such.²²⁸

4.2.4 Planck

Max Planck also declares that the imprecision presented by quantum theory does not exist in the physical phenomena themselves, but in their mathematical formulations. Things are not indeterminate, the mathematics is indeterminate. The physicist must be aware that he translates the sense world into a physical world picture, and that the two are not identical. The value of the translation depends on the reliability of the translator. As man is part of nature, he cannot predict natural events with absolute accuracy. However, a better description than indeterminism may be found. Planck states that physics is improving steadily in precision and completeness. Its fundamental building blocks are the universal constants. All processes in nature are subject to universal and rational laws that are partially knowable by man and to which man is subject. A metaphysical absolute is the real within and behind all, but it is beyond physics realm.²²⁹

4.2.5 Einstein

Albert Einstein does not accept the interpretation of the role of physical theories arising from the Copenhagen discussions. He declares quantum mechanics as incomplete because it can only offer a statistical interpretation of nature and statistics is simply a mathematical tool without physical reality. Einstein does not accept a basic indeterminism in man's knowledge of natural phenomena, and

declares causality as an absolute law in physics. He is deeply troubled by the idea of uncertainty as inherent in nature, claiming physics is simply not measuring precisely enough. A one to one correspondence must exist between theory and nature. Physics must describe nature directly, not its knowledge of nature. 'God does not play dice!' Einstein retorted to his fellow physicists, and he concentrated all his energies on trying to discover the game God does play. Through his work on unified field theory, Einstein sought to uncover the true universal and rational order of nature.²³⁰

4.2.6 Wigner

Eugene Wigner feels that the laws of physics must be modified to deal with a more general situation in which life and consciousness have significant roles. Quantum theory deals with the connections between observations, and therefore cannot be discussed without reference to the observing consciousness. Wigner describes the wave function as a composite of all possible observed systems that develop indefinitely until consciousness enters and collapses the wave function so that one possible observed situation is actualized. Therefore, only through the intervention of consciousness does the system move into a definite state. All experiences of past observations modify the observer's appraisal of the probabilities of his future experience. Wigner's main argument for the inclusion of consciousness in physics is that every action has a reaction, and, as matter clearly influences consciousness,

the converse influence must also be true. Thus, physical laws are incomplete until modified to include consciousness.²³¹

4.2.7 Everett

Hugh Everett claims nature can be exactly represented mathematically. He accepts the mathematical formulizations of quantum theory, stating that the wave function actually describes physical events. There is a wave function for the entire universe containing all observers. This wave function of the universe never collapses, and thus all possible outcomes of any observation occur. There are many worlds, one for each possible outcome of each measurement for each observer. The wave function describes a complex space of an infinite number of dimensions and, therefore, an infinite number of universes can co-exist in the same space. There is no physical communication between these universes as they are mutually orthogonal. Everett presents a picture of the universe constantly splitting into a stupendous number of branches, all resulting from measurement-like interactions with its myriad components. Each quantum event splits the universe and all possible realities so created exist simultaneously, all equally real and non-interacting. As every possible outcome of an event is equally probable, chance is not a measurement of ignorance about a system, but an absolute.²³²

4.2.8 Wheeler

John Archibald Wheeler asserts that we will understand how simple the universe is when we understand how strange it is. Wheeler describes an infinitely dimensional superspace of which the classical concept of space time is an abstraction. The quantum fluctuations in geometry indicated in quantum theory are a property of all space. These fluctuations become significant at very small distances because of the huge amounts of energy involved. Wheeler postulates that the fabric of space is a quantum foam in which quantum fluctuations create singularities or bubbles, which are wormholes interconnecting every point in space. He claims quantum fluctuations differ only in degree from the probabilistic scattering of particles in interactions. As a particle facing impending disaster with another particle scatters, so the universe facing collapse scatters. A probability wave propagating through superspace scatters at the point in superspace where gravitational collapse is expected, resulting in an alternative history of the universe. At very short distances, the violent quantum fluctuations are gravitational collapses of local universes. These collapses are not final, but are continually occurring and being undone, resulting in a probability distribution of new, co-existing histories. Collapse and fluctuations are two aspects of the same geometrodynamics.

Wheeler declares that nature conserves nothing. Mutability is the central feature of physics. Both the geometry of space and particles are derived from a more primordial pregeometry. Geometry and particles, the constants and dynamic laws of physics are simply fossils

of the violent conditions of the big bang at the origin of the universe, and they will be rubbed out in the inevitable gravitational collapse of the whole universe Wheeler finds predicted by the closed model of the universe of general relativity. Between these two extremes lies the staircase of the laws of physics. Beyond the physical laws is nothing, chaos, the pre-geometry on which physical laws are built. The world is brought into being by those who participate, who limit the chaos to yield laws.²³³

4.2.9 Sarfatti

Jack Sarfatti explores the physical roots of consciousness. He sees space-time as derived from a primordial, self-referencing pregeometry, the quantum principle that essentially involves mind. The range of conscious processes is the very short distances where space-time collapses into singularities, the quantum foam of rotating mini black and white holes that enable the instantaneous communication of all points in the universe. This communication occurs through direct quantum jumps in tachyonic world lines, superluminal transfers of negentropy that transcend space-time. The high degree of order or information exchanged is not tied to energy or matter flow. Sarfatti develops Wheeler's concept of the participator, making the consciousness of the participator the determining factor for each quantum jump. Generally the collective will of all participators, all conscious entities, is unfocused leading to the apparently random character of

quantum fluctuations. However, some participators have enough volitional control to consciously impress a coherent structure on the incoherent energy of the quantum turmoil. Not only are scientific facts and laws created by those who participate, but the actual universe is thus brought into being. All possible histories of the universe occur and interfere constructively to give the most probable history, which is the one ordinarily experienced. Mind is the highly ordered structure of matter in space-time.²³⁴

4.2.10 Conclusion

Several physicists, extrapolating far beyond the presently accepted physical theories, find in science the possibilities for explaining all aspects of human experience, from commonly experienced physical and mental events to paranormal experiences.

The above discussion demonstrates that, rather than making nature more accessible and comprehensible, modern physical theories of nature are growing increasingly strange, introducing an image of constant flux and paradox, multiple universes and irregularity, forcing man to think in new ways. Current physical theories are alien and difficult to discuss, being beyond man's ordinary concepts and language, and not logically derivable from his sense impressions. Can man be said to understand something he cannot express in words? The question arises if such presentations can ever become familiar aspects of man's ordinary worldview. Indeed, the variety of interpretations of modern physics

raises the doubt if physics can come to a consistent and comprehensive universal order such as it has been able to provide in the past.

It is naive to assume that nature is organized in the same manner as modern physical language.²³⁵ The modern physical theories discussed above indicate the inherent limitations of existing attempts to precisely portray the physical world. However, some physicists, such as Everett and Sarfatti above, interpret the present physical theories as literal descriptions of the universe. They replace the absolute determinism of classical physics with an absolute indeterminism from quantum theory. The physicists meeting in Copenhagen are wise to warn that the probability function of quantum mechanics is only an algorithm. The wave equation does not detail the properties of matter, but simply provides a means for analyzing and interpreting certain kinds of information. So all physical formulations are but tools aiding in the discernment of universal order. Physical theories are not perfect descriptions of physical phenomena and thus have inherent inconsistencies and insoluble problems. They are a symbolic language for discussing physical phenomena and have only indirect significance for the natural world. These theories become artificial if applied formally.

However, the Copenhagen interpretation of quantum theory sees the uncertainty principle as an inherent limitation of scientific knowledge. But the limitations being presently faced in physics may be overcome by new and unexpected developments. Planck is correct in asserting that a more detailed and meaningful description of physical phenomena may be found. The physicist's conception of nature is

continually changing. Too much importance should not be attached to present concepts as there are likely to be fundamental future developments. Too many unanswered questions exist to determine physics absolutely at this time.²³⁶ Indeed, the question arises if physics can ever be absolutely determined.

One of the main considerations facing physics today is determining the relationship of consciousness to the mechanisms of the physical universe. As the observer is now considered a vital aspect of experimental situations, it is possible that consciousness will come to play a major role in physics. Physicists are divided on the issue of whether the observer's role is passive or non-passive. Sarfatti's and Wheeler's proposals that consciousness is the substratum or determiner of physical phenomena may prove to be an important avenue of research. Unfortunately, Sarfatti's discussion of consciousness reduces it to little more than another physical process. It is rather presumptuous to assume physics can explain all the facets of consciousness. Perhaps the question of consciousness is not a physical problem, but a question for a different field of research.

Modern physics does not appear to have moved nearer to the essence of nature than classical physics. In fact, the more closely physics analyzes physical phenomena, the more ethereal it becomes. A growing number of physicists question the idea that there are fundamental building blocks or simple laws at the bottom of the physical world. While some physicists see simplicity at the basis of nature, others see a vast sea of chaotic flux, a zoo of complex disorder. Physics has reached the point where it questions if there is a bottom

level to the physical world. Many physicists are inclined to view nature as a web of interrelated events with no part being more fundamental. Thus, even the concept of levels is being queried.

In the light of the manner of scientific development and current physical theories, Wheeler's declaration that no physical law is immutable seems valid. Some physicists, although unwilling to accept present physical theories as the final statement physics can or will make, hope for a complete description of physical phenomena in the future. However, the one to one correspondence between theories and the universe that Einstein demands cannot be justified. Physical theories are idealizations and abstractions from experience. As Heisenberg clearly states they present a picture of man's knowledge of nature, his manner of questioning, not a literal description of nature. Physical theories are not necessarily more correct today than those of the past, they may simply be more relevant to the kinds of questions man is asking. The universal orders discerned by physics are changing insights that move with man's experience, not final eternal truths. Although physics may move to qualitatively new or apparently deeper levels of insight into natural processes, physics cannot capture the whole of existence in its descriptions.

The major problem confronting physics today is that although it has theories that work, theories that are able to analyze events and provide utilizable information, these theories do not provide man with a sensible cosmology. Science seeks meaningful order, and it is unlikely it will rest with the chaos it is uncovering in the depths of matter. But for physical order to be meaningful to the life of man, it must be

placed in the context of the whole of man's experience. Perhaps insights from non-scientific fields can be instructive to science in its task of helping man find a place in the world.

5. HOLONOMY - DAVID BOHM

The physicist David Bohm is aware of the inherent fragmentation and limitation existing in the methodology and content of modern physics, and he is concerned with the meaninglessness of modern physical theories to modern man. Yet, he also recognizes within the scientific method and present physical theories a movement towards undivided wholeness, indicating the necessity of a new order in physics. Bohm proposes holonomy, the law of the whole, where all implicates all in undivided wholeness, as the basis for a new order. The distinction of explicate and implicate²³⁷ orders is relevant for a clearer understanding of the whole and for understanding of physical phenomena and consciousness, and their relationship. Beyond the implicate order is the holomovement. The holomovement is not a fixed, final order, but a movement in which new wholes are continually emerging.

Bohm's discussion is comparable with Nāgārjuna's and Śāṅkara's presentations. It is from the perspective of a modern physicist, but is based on insight going beyond the strictly scientific and western perspectives. This discussion provides a further illumination of the frame of 'selective understandings of reality and the non-selective reality' in a context meaningful for modern western scientific culture.

5.1 The Scientific Process

Bohm is concerned with the problems arising from fragmentation and seeks to propel an orientation to wholeness. Most attempts to understand the whole are linear and summative, reducing the whole to a complex totality, which is no more than just another part. Science normally proceeds through analysis, that is breaking up physical processes into autonomously existing elements of fixed natures and then attempting to synthesize these parts into a coherent system. But the whole of the infinitely interacting universe is not simply a sum of its parts.

Analysis is useful and necessary, provided it is applied with an awareness of its limitations. However, normal science extends fragmentary analysis beyond the sphere where it is valid. Physical theories present various views of aspects of the universe. But too often they are taken as literal descriptions of the whole of existence. The mistaking of partial viewpoints for the whole becomes an unconscious and self-reinforcing habit, leading to extended breaks in what exists. Attention to the habit of fragmentary thought and an understanding of the relationship of the aspect to the whole is needed to end fragmentation and gain new insight into the whole.²³⁸

Science is continually seeking and discovering basic orders by which it hopes to describe the physical processes of the universe. Bohm describes the general way of perceiving order as giving attention to similar differences and different similarities. A hierarchy of similar differences leads to higher degrees of order. In a high degree of

order, each suborder has limitation. Bohm calls this limitation measure. Measure is specified through proportion or ratio, with this specification containing the notion of boundary or limit. The harmoniously organized whole of order and measure, which is both hierarchic and extensive on each level, determines an overall structure. Bohm stresses that structure is essentially dynamic in nature. It is an organized whole of everflowing building, growth and evolution.²³⁹

Physical theories are changing insights which shape experience and provide different views of reality. Each theory abstracts an aspect of reality that is relevant in a certain context. A fact is what has been manufactured.²⁴⁰ Beginning with a perception of the actual situation, a fact is developed by adding further order, form and structure to it with the aid of theoretical concepts. Both facts and theories are aspects of the whole in which analysis into separate but interacting parts is not relevant. The validity or truth of facts and theories is dependent on the context, and both must be continually fitted to new experiences. Physics accomodates between facts and theories by adaption within the basic notions of order. Often accomodation in the existing frame of order is adequate. But it is possible for old orders to become irrelevant, necessitating a fresh insight into the whole context, which is then articulated in a new order, measure and structure.²⁴¹

Science has a tendency to see certain notions of order as permanent or to seek a fundamental order or description of the universe. But Bohm stresses that there is no meaning in speaking of a fundamental theory on which all physics would have a permanent basis or to which all

phenomena of the physical world would be ultimately reduced, for each theory discusses only an abstracted aspect of reality and is relevant in a limited context. There are no absolute laws. Even the most sacred physical laws eventually become inadequate, for each is but a step in an unending process of development to deeper levels. Each physical description is incomplete.

Thus, Bohm introduces holonomy, the law of the whole, which is not a fixed final goal of science but a movement in which new orders are continually emerging. The law of the whole includes the possibility of relevating²⁴² selective aspects that are broad enough for the description of given limited contexts. These explicated aspects appear relatively autonomous, but actually have no meaning apart from the greater whole. The whole does not need to conform to a particular order or to be bound by a measure. Generally all forms of the whole merge and are inseparable. Seeing the whole as a process leads to harmony.²⁴³

5.2 Modern Physical Theories

Bohm criticizes classical physics for its method that regards the universe as analyzable into separately and independently existing elements which interact in a non-arbitrary and mechanistic manner. Classical concepts, including the idea of the constituent element, Cartesian co-ordinates, Euclidean order and measure, and universal and absolute time independent of space, present a fragmentary and deterministic picture of the physical world. The attitude of breaking

up the universe into parts and then synthesizing these parts into a total system treats the whole as a thing among things, and has only limited validity.²⁴⁴ Bohm states that the classical approach to the examination of physical phenomena and the establishment of physical order must succumb to a fresh perception of the whole, where specific phenomena and orders are understood as abstractions with no meaning independent of each other or of the whole.

Bohm points out that some aspects of modern physical theories imply a new notion of order based on undivided wholeness. For instance, as discussed in the previous chapter, special relativity demonstrates that the observation of physical order is relative to the speed of the observer's frame of reference and introduces a four dimensional space-time continuum. Mass and energy are disclosed as different manifestations of a single essence. General relativity emphasizes the continuity of the field and its non-linear equations prevent the analysis of the universe into separate but interacting parts. It describes matter, gravity and geometry as inseparable aspects of the curvilinear order and measure of space-time. Localized structures are events or patterns of movement, rather than fixed bodies. In quantum theory the properties of matter are disclosed as statistically revealed potentials, and this probability function of an observed object cannot be specified apart from a description of the overall system set up to observe the object. In quantum theory matter reveals both wave and particle facets, depending on the context, and precise specifications of the behaviour of atomic particles is no longer possible. Quantum leaps are indivisible and unanalyzable, and events separated in space are

correlated in ways that are incapable of detailed causal explanation. In modern physical theories primary emphasis is placed on the continuous field of the whole universe, with particles regarded as abstractions from the field or regions of intense field which interpenetrate with all other particles or abstractions. Thus, the field and particle are inseparably interwoven. These theories imply that ultimately the whole universe is an undivided whole, where analysis into independent parts is not meaningful.²⁴⁵

However, there are aspects of these modern physical theories which conflict with the notion of unbroken wholeness. Fundamental to relativity is the concept of a signal, an ordered modulation that must be causally propagated at no more than the speed of light if the information it carries is to be unaltered. A signal requires that its source be clearly separated from the region in which it is received, not only spatially, but also in the sense that the two must be autonomous in their behaviour. In quantum theory, the linearity of the equations allows the wave functions of the system to be regarded as existing separately and autonomously. Thus, the actual individual object of classical physics is replaced by a more abstract statistical object. Bohm declares both relativity and quantum theory as inadequate as both have fragmentary residue.²⁴⁶ These autonomous residues are the cause of irreconcilable contradictions between the two theories which prevent them from being unified in a more encompassing physical description.

Bohm proposes retaining those aspects of existing modern physical theories which point to undivided wholeness and dropping those aspects which conflict with it, to uncover a new notion of order. The

aspects of relativity and quantum theory that are still valid under such conditions could be united harmoniously, resulting in a qualitatively new theory, within which the present theories of relativity and quantum mechanics would be retained as aspects or abstractions. Bohm's aim is a new perception of physical phenomena from the perspective of undivided wholeness.²⁴⁷

An additional problem which Bohm has with existing descriptions of physical phenomena is that they are not understandable. The first reaction of students to quantum theory is that they are unable to understand it. Eventually they realize that there is nothing to understand, that the wave equation simply provides the rules for computing results to compare with experiments. Nevertheless, it is supposed to discuss physical reality. Mental gymnastics are required to smooth over this contradiction. Viewing quantum theory as an algorithm with no physical basis does not provide a consistent and meaningful worldview. But, to interpret quantum theory as indicating an irreducible indeterminacy in nature is equally unsatisfactory. Another possible solution to the quandary of quantum theory is to develop a new quantum logic. Bohm finds all these proposed solutions inadequate because all do not provide an intuitive understanding of quantum phenomena.²⁴⁸

Bohm proposes seeking a deeper understanding of physical processes. The inherent limitation apparently indicated by current quantum theory indicates the necessity of a new order in physics. This proposal does not entail ignoring the formalism of quantum theory. Rather, the full extent of its novel conceptual implications should be

explored. But the operation of statistical laws is not a reason for denying the search for more detailed individual laws which apply in broader contexts. If one theory is possible, so is another, better theory which leads to new experimental results, and Bohm takes steps towards uncovering a deeper level of order which provides a more detailed explanation of physical phenomena. Bohm seeks a clear intuitive understanding of physical reality in the context of the indivisible whole.

5.3 Explicate and Implicate Order

Bohm introduces the distinction of explicate and implicate orders as relevant to attaining a clearer intuitive understanding of the physical universe and the law of the whole. He states that every immediately perceived aspect of the whole comes out of a more comprehensive implicate order. The implicate order expresses an undivided wholeness wherein all aspects are holistically enfolded or implicit and not yet apparent, defined or explicit as separate elements. To implicate is to fold inward, to have the whole enfolded in each region. As stated above, a series of similar differences constitutes an order. If these differences are in the same degree of implication, a distinct implicate order is described. The law of the whole includes the possibility of the enfolded order unfolding and relevating selective aspects so that they appear relatively autonomous in limited contexts. These explicated aspects are not disjoint and separately existing

things, but abstractions from the whole. To relevel is to call attention to aspects of the implicate order so that they stand out in relief. The enfolding of a particular explicate order of the whole is governed by the laws of the implicate order.²⁴⁹ Whether an explicate or implicate order is discerned depends on the perspective of the viewer.

Explicated aspects are only a portion of the nonmanifest implicate order, and therefore are incomplete. They have their place but habitual familiarity with them results in taking these aspects for actual descriptions of the whole. Thus, they obscure and usurp the potential of the whole. Generally, physical laws refer to the explicate order. Each deals only with abstracted aspects of the whole which are relevant only in selective situations. The explicate order is incomplete and fragmentary in nature, leading to contradiction and confusion and making the formulation of coherent physical laws difficult.²⁵⁰

The implicate order avoids many of the problems of the explicate order by looking at the universe more fundamentally and by introducing a higher degree of order into the domain of physical laws. Moving from the manifest to the essential by penetrating to broader orders of movement beyond immediate perception is the only way to solve the problems of a limited perspective.

The explicate and implicate orders must not be confused. The implicate order is not reducible to a more detailed or complex explicate order. The explicate order may be adequate in certain contexts, but it has little meaning apart from the deeper implicit whole. The two orders complete each other, with the explicate order implying the implicate

order. The manifest is the outcome of the nonmanifest. The nonmanifest is greater than the manifest, but is still related to the manifest.²⁵¹ Once the implicate order is regarded as the more fundamental order, aspects, as relativity independent subtotalities broad enough for the description of a specific context, can be abstracted.²⁵² Thus, Bohm stresses giving primary relevance to the implicate order.

There are many levels of implicate orders of varying degrees of subtlety. But the implicate order is still in the realm of expressible ideas and therefore limited. It is better able to deal with reality than the ideas of the explicate order, but it still does not grasp the whole of reality. The implicate order is necessary as man needs ideas to deal with reality coherently. But it implies an ineffable and infinite wholeness beyond itself, and it can become a hindrance if it is not transcended. The implicate order acts as a bridge, loosening rigid attachment to the abstractions of the explicit order and moving man in the direction of the deeper whole.²⁵³

The holomovement is more fundamental. The implicate order is grounded in the holomovement, the unending flux of enfoldment and unfoldment. Particular aspects of the holomovement merge and are inseparable. It moves between the explicate and implicate orders, being still more inward than the two orders which are its extremes. The movement is basic, and specific states are its abstractions. Infinitely subtle and without boundaries, the holomovement does not need to conform to any order or be bound to any measure.²⁵⁴ It is the eternal and indefinite movement of the whole.

5.4 The Lens and the Hologram

To provide a clearer understanding of his proposed manner of perceiving the whole, as opposed to attempts to understand the whole through analysis and synthesis, Bohm suggests considering the differences between the optical lens and the hologram. He feels that this distinction is conducive to the perception of a new order that is relevant for physical laws.

A lens encourages the dissection of the universe into separate parts. The essential feature of a lens is that it brings the correspondence of specified features of an object and its image into sharp relief, thus strengthening an awareness of the various distinct parts of the object and the relationship between these parts. In this manner it furthers a tendency to think in terms of analysis and synthesis.²⁵⁵

The hologram, on the other hand, provides an appropriate symbol form for perceiving the unbroken whole, in which analysis into well-defined parts is not relevant. In the optical hologram, a beam of coherent laser light is split into two beams, with one beam being reflected off an object and the other being used as a reference beam. The convergence of the two beams creates an interference pattern which is recorded on a photographic plate.²⁵⁶ The resulting interference pattern is extremely fine and complex, and distributed equally and ubiquitously throughout the plate. If any small region of the plate is illuminated with coherent light, the whole illuminated object is

revealed, although somewhat vaguely and from a decreased range of possible points of view, so that the whole is found to be enfolded in each part. Thus, with the hologram, in each region of space the movement of light implicitly contains a vast range of distinctions of order and measure appropriate to the whole illumined structure. There is not a one to one correspondence between the parts of the illumined object and the parts of its image on the photographic plate. Rather, all parts are interrelated and each part contains the image of the whole object implicitly.²⁵⁷ The whole not only contains its parts, but is potentially present in all its parts, so that the whole and its parts cannot be separated.

The lens, with its analysis of the universe into autonomous elements, is a limiting case of the hologram, with its tendency to see aspects as relevant to the whole structure. Although the optical hologram is a meaningful symbol for gaining insight into the whole, it is, however, only a partial analogy that is static and abstracted, and it cannot reveal the total depths of the flowing movement of the whole.²⁵⁸

In the optical hologram in each region of space the order of the whole illumined structure is enfolded and carried in the movement of light. This order and movement can be enfolded and carried not only in electromagnetic waves, but also in countless other forms of movement. To generalize, so as to emphasize undivided wholeness, Bohm proposes that what carries the implicate order is the movement of the unbroken whole which he calls the holomovement.²⁵⁹ The hologram is a limited static image. The holomovement is the unlimited and essential movement

of the whole.

Bohm proposes that the structure disclosed in the hologram extends over the whole universe and the whole past with implications for the whole future. The entire order of the universe is enfolded in each region of space and time, so that even if only a part is manifest, the whole is implicitly present. Man is implicated in all he sees and thinks, for he is present everywhere and at all times, and so is every object.²⁶⁰ Although relatively autonomous aspects can stand out in relief against the background of the whole, all implicates all in undivided wholeness.

5.5 The Ink Drop Analogy

To clarify the distinction between the implicate and explicate orders, Bohm provides a particularly vivid illustration of how an enfolded implicate order may unfold as an explicate order of ostensibly discrete, separate elements. He describes a transparent container full of viscous fluid and equipped with a mechanical rotor that can stir the fluid slowly, but thoroughly. Insoluble ink droplets are dropped into the fluid, one after another, and stirred into the fluid. The ink droplets are thus gradually transformed into threads that extend throughout the whole fluid, apparently losing their separate identities. They are enfolded so that they interpenetrate with the whole, appearing only as a mass of grey fluid. Each droplet is enfolded in a seemingly random manner, yet each has an order implicated in the fluid which is

distinct from every other droplet.

If the stirring device is rotated in the opposite direction, the transformation is reversed and each droplet is reconstituted. If the reversed rotation occurs very rapidly, the droplets unfold and again enfold in the fluid so quickly that the individual droplets are not resolved in perception and the appearance of a single, solid object moving through the fluid is created. As the human eye is only sensitive to certain concentrations of dye, it cannot see the whole movement of the dye, rather only the relevant aspects. Each manifested droplet is merely an aspect abstracted from the whole.

In the continuous movement of the fluid and ink droplets, various implicate orders become explicate and explicate orders implicate. The total structure of the dye at any given moment is that in which different degrees of implication are arranged in a certain overall order. Every part of the whole structure contributes to the order of each of the droplets, in their various stages of implication, and each droplet, and therefore each level of implication, irreducibly contributes to the structure of the whole.

The ensemble of droplets is so intermingled that the specific orders of the various droplets appear indistinct. However, the differences in their orders are revealed when the various particles are explicated. The structure relates only those aspects with the same degree of implication. Thus, the picture which the human eye can perceive at a given time is only the image of those aspects which can be explicated together, that is those droplets that are synochronous or possess the same degree of implication. The explicated droplets cannot

consistently be regarded as autonomous. Each aspect has no meaning apart from the whole structure.²⁶¹ The whole implicate order is present at every moment and contributes to each explicated droplet.

By asserting that the whole is implicit in every part of the implicate order, Bohm is introducing a radically new description incorporating the wholeness of form. He sees this order of unbroken wholeness as a possible means of explaining previously inexplicable quantum phenomena. For example, the quantum leap, where a particle appearing at a certain position disappears only to reappear inexplicably at a new position, can be visualized as a particle unfolding, enfolding and unfolding again, as in the ink drop analogy. As the senses are only aware of the explicate movements of the particle, its implicate developments appear unanalyzable. Non-causal correlations also become understandable. Two particles spatially separated at the explicate level are implicitly interconnected. The fact that in quantum mechanics an object cannot be specified apart from a description of the overall system set up to observe the object is the result of the whole structure being implicit in every part, whether explicate or implicate. The constituents of physical theories, such as particles and waves, space, time and movement, are only abstractions of the nonmanifest implicate order and therefore incomplete in isolation.²⁶² Bohm stresses the need for a thorough wholeness in physical thought.

5.6 Higher Dimensional Order

Thus far the implicate order has been presented through images of a process of enfoldment and unfoldment taking place in ordinary three dimensional space. Bohm, however, feels the implicate order indicates a higher dimensional reality, of which the three dimensional world of ordinary experience is but an abstraction.

To illustrate the abstraction of lower dimensional phenomena from a higher dimensional reality and their correlation, Bohm discusses the relationship of two unique two-dimensional movie projections of a single three-dimensional object. He presents the scenario of two movie cameras filming the movement of a fish swimming in an aquarium, as seen through two glass walls at right angles to each other. When the two films thus recorded are projected onto separate screens, each image will appear generally different, and yet there will exist a relationship between the two images. As the fish projected on one screen executes certain moves, the fish projected on the second screen will execute corresponding moves. Thus, the two images are correlated and reflect each other. Both images refer to a single whole, the common ground of both. They are simply two-dimensional abstractions of a three-dimensional reality. The three-dimensional reality holds the two-dimensional projections within itself as abstractions, and yet is neither, being of a nature beyond both.²⁶³

Bohm suggests that in a similar fashion particles are projections of a higher dimensional reality. In quantum theory, the interaction of several three-dimensional particles must be described by

equations of higher dimensions, leading to a higher degree of order in physics. The interaction of two three-dimensional particles must be described by a six-dimensional wave equation. The interaction of n three-dimensional particles leads to a wave equation of three n -dimensions. The eventual result is an infinitely dimensional universe which cannot be reduced to three dimensions. Under certain conditions abstracted three dimensional particles will exhibit relatively independent behaviour. But, in a manner similar to the two dimensional projections of the three dimensional fish, such particles will exhibit correlated behaviour that implies they are projections of a higher dimensional whole.²⁶⁴

Thus, the implicate order indicates a multi-dimensional reality. The examples of the hologram, the ink droplets and the projections of the fish are only three dimensional approximations of this higher degree reality. The order of the whole is a process of unfoldment and enfoldment in a multi-dimensional reality, which, under certain conditions, can be explicated to a three dimensional abstraction.

5.7 The Mathematization of the Implicate Order

Bohm states that a vague notion of the implicate order is not sufficient. He stresses that it is time to present physical theories in terms of this deeper order. He thus begins the process of the mathematization of the implicate.

The mathematization of the general language of physics makes

possible a more precisely articulated discussion of the implicate order than is possible in the general language alone. The general language of physics and its mathematization work together coherently and harmoniously as two aspects of one whole. A dialogue between the two leads to new meanings common to both aspects. In physics the explicate order arises as an aspect of sense perception and is described in Euclidean order and measure. The simple geometrical changes within a given explicate order are transformations, and these physical processes of the explicate order can be readily mathematized. The implicate order is described in a higher dimensional order and measure, and discusses more radical kinds of change, which Bohm calls metamorphoses. Bohm demonstrates how effects demonstrated by the hologram, where the whole illumined structure is enfolded in each region of space, can be mathematized. He also demonstrates how the enfolding and unfolding of ink droplets in viscous fluid can be mathematized.²⁶⁵ Thus, the possibility of a relevant mathematics coherently related to the general language for discussing the implicate order and its metamorphoses is disclosed.

Algebra contains features similar to the features of structures built on implicate orders. Individual algebraic symbols are not directly relevant in isolation. Only in the relations and operations in which they take part are they made relevant. In this way they correspond to words, whose implicit meaning is only fully realized in the manner language as a whole is used. In the general language for the description of implicate order, the indefinable and immeasurable holomovement is considered as the whole from which all that is to be

discussed is ultimately relevelated. Similarly, in the algebraic mathematization of general language, an indefinable algebra is the whole from which each algebraic term is relevelated. Each term derives its meaning by signifying a whole movement in all the terms of the algebra. This similarity leads to the possibility of a coherent mathematization of the general description which takes the whole to be the indefinable and immeasurable holomovement. As relatively autonomous aspects of the holomovement can be considered, so, in its mathematization, relatively autonomous subalgebras, as aspects of the indefinable whole algebra, can be considered. In both cases the law of the whole context limits the autonomy of the aspects. A given physical context can be described in terms of an appropriate subalgebra. As the limits of the given context are surpassed and its description becomes inadequate, broader algebras must be considered. Algebra itself is a limited form of mathematization and eventually it may be necessary to move beyond it. Nevertheless, it still offers a range of aspects for modern physics to explore.²⁶⁶

5.8 Hidden Variable Theory

Bohm states that scientific progress is an unending process of moving to ever deeper levels of implicate orders. He feels that physics can now step to a deeper level of exploration than the indeterminacy of quantum theory through his hidden variable theory. His hypothesis is that the results of individual quantum mechanical measurements are determined by new kinds of factors. These factors can be represented

mathematically by a set of variables beyond those currently existing in physics. The variables describe the states of these new entities in a deeper subquantum level and obeying qualitatively new laws. The search for these new variables should take place where present theories lead to inconsistent results and unsolved mathematical difficulties, the very small distances and high energy of the violent quantum fluctuations. The hidden variable theory would predict results consistent with those predicted by the ordinary interpretation of quantum theory, but based on different assumptions concerning the existence of a deeper level of individual laws. The further variables in the subquantum realm would enable a more detailed determination of the unanalyzable fluctuations resulting in existing quantum measurements.²⁶⁷

In the deeper implicate order, the theory of relativity's consideration of space is no longer adequate. Relativity provides only an explicate ordering of space, with space being regarded as a continuum that can be covered by a complex, that is the joining together of many separate objects, and discussed in terms of coordinate systems. It is a view of space as a set of unique and well-defined points, related topologically to a set of neighbourhoods and related metrically by a definition of distance. An implicate ordering of space introduces the idea of a multiplex, that is the enfolding of unlimited systems of orders and measure into each other. With the introduction of the implicate order, relativity's concept of a signal, which is constituted of an explicate order of events, is also no longer relevant. The theory of relativity states that all co-ordinate systems furnish equivalent frames of reference. The law of the whole considers structures to be

implicate relative to each other.²⁶⁸

Bohm feels that his efforts to mathematize the implicate order will result in a more detailed explanation and understanding of physical phenomena than quantum theory and relativity provide. Experiments in new domains and to new degrees of approximation will result in new entities, methods, laws and efforts which may substantiate his theoretical proposals. Bohm is not adamant that his hidden variable theory is the best course for physics to pursue. It is impossible to know beforehand which avenue will prove to be the most fruitful, thus many avenues should be explored. For Bohm, this theory is the most conceivable possibility and he explores it to avoid the stagnation that he feels results from accepting current physical theories as the limits of physical knowledge.²⁶⁹

5.9 Physical Theories as Aspects of the Whole

The law of the whole places the entire context of physics into a new structure. The implicate order extends indefinitely in a multi-dimensional reality in which relatively independent subtotalities may be abstracted. Thus, classical physics, quantum theory and relativity theory, and even the hidden variable theory, are aspects of a more comprehensive structure. Reality appears as a series of levels of implicate orders, a hierarchy of subsystems, systems and supersystems. Each level of order is, to an extent, influenced by all other levels. A level is not fully comprehensible in terms of the next lower level

alone, although the next lower level may be its main determiner. Each level irreducibly contributes to the description of the whole and the whole is reflected in each level. A relatively independent physical context can stand out in relief against the background. However, ultimately all levels and contexts, explicate and implicate, merge in the unknown whole of the universe.²⁷⁰ It is not possible to arrive at an ultimate physical theory. Implicate orders may be expressed, but the process of describing ever subtler levels of reality is endless. Bohm presents a thoroughgoing wholeness, where all implicates all in undivided wholeness.

Bohm's discussion of physical theories does not actively include the observer. He seeks an understanding of the relatively independent physical context. Some physicists place the observer in a central and active position in modern physical theories. Bohm, however, feels that this is leaping ahead of existing evidence. He does recognize that consciousness is an aspect of the whole, as well as matter, and is implicitly present everywhere. He also admits that a comprehensive explanation may be found which encompasses both consciousness and matter. However, Bohm states that there is no evidence as yet for introducing a non-passive observer, and thus he treats the observer as functionally separate from the physical context and active only in interpretation. Bohm will widen his physical theories to include consciousness if and when it is demanded by evidence. But, for now, he is satisfied with a non-passive observer. He also does not accept Jack Sarfatti's proposal that consciousness is the essence of matter, the hidden essence behind all physical phenomena. Rather, the whole, the

essence of all, is indefinite and beyond such classification as consciousness and matter.²⁷¹

5.10 Explicit Thought and Implicit Consciousness

Despite Bohm's exclusion of consciousness from his current work in physics, he does find the law of the whole relevant for an understanding of consciousness. By distinguishing between explicit, mechanistic thought and the implicit intellect, and warning of the destructive tendency of aspects of thought to usurp the whole of conscious thought, Bohm provides an interesting insight into the nature of consciousness.

The explicate order of consciousness consists of associative thought, with one thought automatically following another mechanistically through an association determined by habit. Thought consists of routinely and passively arranging the images arising out of memory with sensory experience to condition the next thought. The flow of experience is seen as fleeting impressions against a background of the separate features of the content of thought which are ordered in terms of the totality of relatively static images recorded in the past. Associative thought rationally analyzes experience into explicit, discrete elements. Time is present only in the content of thought. Yet thought changes deterministically with time and is of the order of time. Associative thought is only an abstracted fragment of consciousness, a

limited order explicated from the whole of conscious activity.

Associative thought points to the deeper, implicate order of consciousness, the intellect. The condition for the awakening of the intellect is the non-operation of mechanistic thought. The intellect is of a different quality. It is not a product of memory, nor can it be analyzed and defined. Timeless and without restrictions or blocks, the intellect is the inner formative activity that is implicitly in touch with the whole of consciousness.²⁷²

The whole of consciousness is an indefinite, flowing movement, a ceaseless flux from which explicate and implicate orders emerge. However, the access of personal consciousness to the implicate order is limited by a residue of memories with a specific, explicated configuration, causing the mind to resonate with only a small subset of information. Attention to a certain manifest context of consciousness, based essentially on memory, allows the recurrence and stability of a relatively independent subtotality of thought. This process is brought about as a part of the same process causing recurrence and stability in the manifest order of matter. The continuity of a certain pattern of thought unfolding regularly becomes a self-reinforcing and unconscious habit. The repetition of an explicated order of thought results in it being seen as primary. This aspect of consciousness extols itself and imposes its order onto the whole of consciousness, usurping the implicate intellect.²⁷³ The domination of the whole by an aspect leads to fragmentation and contradiction, conflict and confusion.

However, in each moment of consciousness, the explicated thought content has a deeper implicate content which completes it. Stilling the

operation of thought removes its restraints, limitations and fragmentation, and enables a movement at the subtler levels of consciousness. The intellect provides a deeper understanding of the forming activity underlying thought. It has insight into the implicit aspects of consciousness and thus creatively arranges the content of consciousness in qualitatively new ways. Insight results in seeing new basic differences, new forms and arrangements, and new interconnections. It provides an aesthetic perception of the harmony of structure and a sense of undivided wholeness.²⁷⁴

Consciousness as a whole is the common source of thought and the intellect. It is an indefinite whole from whence all perception, explicate and implicate, arises. The implicate order of the intellect can have some insight into the underlying consciousness, but it can never grasp it in its wholeness. Consciousness resonates between the explicate and implicate orders, but is a deeper stream of awareness than both. Each movement of consciousness is in immediate contact with all levels of conscious order. Each aspect of awareness is inseparable from the whole. All mutually enfolded aspects of consciousness harmoniously merge in the whole of consciousness.

5.11 Matter and Consciousness as Aspects of a Greater Whole

Moving to an even deeper level of implication, consciousness and matter are regarded as aspects of the fundamental substratum, the unbroken whole of holomovement. The relative independence of consciousness and matter is apparently manifested in explicated orders of description. However, they are interrelated projections from the primary flux, which is the common ground of all.²⁷⁵ The unbroken whole is beyond all such classification. It cannot be described in forms involving fragmentation and boundaries, but only in terms of harmonious interpenetration.

Bohm implies thoroughgoing wholeness. Man is implicated in all he sees and thinks, for he is present everywhere and at all times although only implicitly. The same is true of every object. Every moment of time contains the entire past with implications for the entire future. Every person, every object and every time are aspects of the whole, and are folded together with every other aspect of the whole. Even the idea of the whole must merge into the whole. The divisions between individual consciousness, between matter and consciousness, space and time, in fact all divisions, fall away.²⁷⁶ The whole is enfolded in all orders and in all aspects. All implicates all in undivided wholeness.

5.12 Holonomy

Only holonomy, the law of the whole, is adequate to the discussion of the whole. Holonomy must be distinguished from autonomy and heteronomy. Nothing is a law unto itself. At best there can be relative and limited autonomy in certain conditions and degrees of approximation. However, a given relative autonomy is limited by other relative autonomy. As everything interacts, nothing is self-ruling. Heteronomy is also inadequate, for it describes a law where relatively autonomous things are related externally and mechanistically. The limitations of autonomy and heteronomy are ultimately revealed by holonomy. 277

Bohm's holonomy is not a fixed, final order, but a movement in which new orders are continually emerging. The attempt to impose order, whether explicate or implicate, on the flowing nature of the whole inevitably results in contradiction. The holomovement is not capable of conforming to any order. It is a flowing movement beyond the limitations of imposed orders.

5.13 The Movement of the Whole

In the movement of the whole, orders may emerge as relatively independent subtotalities. This unfolding is a creative process, with a given unfolded order being new content from a multi-dimensional reality. There is a general relationship expressing a force of necessity which

binds together a certain unique set of elements of implicate order in such a way that they can contribute to a common explicate end. The origin of the force of necessity is not understandable solely in the terms of the implicate and explicate orders of the situation in question, but are inherent in the whole context. Understanding its origin leads to more comprehensive and inward relatively autonomous implicate and explicate orders with corresponding deeper and more inward forces of necessity.²⁷⁸ Manifest orders always depend on the whole context which is a flowing movement.

The flux of unfoldment and enfoldment is unending. There exists an infinity of orders or dimensions of implication. The whole contains an inexhaustible variety of different kinds and degrees of order. The process of disclosing orders of ever deeper levels of implication is endless. The whole is continually changing and thus not capable of conforming to any order. There can be no ultimate description of order, as all orders and descriptions are limited and incapable of grasping the whole. If a given description or order is assumed to express the whole, fragmentation and contradiction result. The notion of implicate orders must be left behind or it becomes an obstacle to insight into the whole. Eventually all conception of levels and orders, whether explicate or implicate, must be transcended. All levels or aspects are interrelated and all contribute irreducibly to the whole. Ultimately all levels merge in the whole with no clear distinctions. The whole is in each part, and each part shares in the whole. All implicates all in unbroken wholeness.

The unending movement of the whole is all that exists. Infinitely subtle and infinitely complex a vague notion of it is enough to know that it exists. But it cannot be defined or measured, specified or analyzed. It is the unknowable, the genuinely real and primary reality. What is, is the holomovement, the ineffable movement of the whole.²⁷⁹

5.14 Conclusion

Bohm's discussion of the aspect as opposed to the undivided whole provides an excellent illumination of the frame of 'selective understandings of reality and the non-selective reality' in a manner largely comparable with Nāgārjuna and Śāṅkara's discussions, and yet relevant to issues of scientific methodology and modern physical theories. His efforts to discuss modern physics coherently proceed with an awareness that such discussions deal only with an aspect of existence, and not the undivided whole. Thus, he is able to provide much useful knowledge and insight without being deluded regarding its limitations. He attempts to make physics intuitively understandable, but from a perspective that goes beyond the purely scientific and western.

Bohm argues that the physical context should be examined independently from consciousness, as there is not as yet evidence necessitating the inclusion of consciousness in physics. The study of physical phenomena in isolation, as an abstraction from a greater whole,

is valid. However, it does not need to preclude the study of physical and conscious phenomena together as another abstraction, perhaps more implicit than the physical context alone. Perhaps the evidence for the inclusion of consciousness in physical theories does not exist as yet because physicists do not know where to look for it. Thus, although consciousness need not be addressed by all physicists, it need not be excluded totally from physics.

Bohm states that matter and consciousness are two aspects of a greater whole, which is undefinable. As consciousness is not the essence of the indefinite holomovement, but an abstraction from it, Bohm does not accept Jack Sarfatti's hypothesis that consciousness is the substratum of matter and all phenomena. However, even if Bohm does not accept consciousness as the essence of the whole, it could prove to be a more implicit order than matter, and thus the basis of matter.

As Bohm clearly indicates, it is important to recognize that further major advances in physical knowledge are possible and that these further advances may necessitate moving into qualitatively new ways of understanding. However, in agreement with Nāgārjuna and Śāṅkara, Bohm states that no matter how deeply man penetrates phenomenal existence, or how advanced his conventional knowledge, it is still inherently limited and thus contradictory, as the whole, or true knowledge, cannot be grasped by conceptual thought.

Although Bohm's discussion is comparable with Nāgārjuna's and Śāṅkara's presentations, it is not precisely the same.

Nāgārjuna and Śāṅkara make a clear and rigorous distinction between relative and absolute knowledge. They both present an

unconditioned absolute reality and deny attempts to characterize it in terms such as movement or non-movement. Their primary aim is simply to provide a means to uncover absolute knowledge and thus true freedom. To this end all limited knowledge and its expressions are denied any ultimate significance and negated.

Bohm clearly distinguishes between the abstracted aspect and the whole. However, he differs from Nāgārjuna and Śāṅkara in describing an endless process of implication. His distinction between the unending implicate orders and the movement of the whole is not clear and rigorous. The holomovement is an endless process of enfoldment and unfoldment. Reality is never static or complete.²⁸⁰ The holomovement is not an absolute of which man can attain final knowledge. Rather, Bohm discusses the value of exploring the never ending levels of implicate order to attain everchanging depths of insight.

CONCLUSION

The frame of 'selective understandings of reality and the non-selective reality' is valuable as it leads to an awareness of both the limitations and potentials of human understanding. Reality allows various non-arbitrary configurations, none of which exhaust the whole. The frame reveals the incompleteness and provisional nature of articulations of interpretations of man's experience. It thus deters any description from dogmatically asserting that it exhausts the whole of possible experience. Mistaking particular viewpoints for the whole of reality and operating solely in terms of such limited perspectives leads to contradictions and manifold problems, and is inherently destructive. Limited viewpoints are useful for ordering man's environment coherently and conveniently, and can be the source of meaningful insight into the nature of reality, provided their incompleteness is recognized. Limited expressions can give a vague notion of the whole, enough to acknowledge its existence, although they are unable to provide an actual understanding of it. Accepting limitation, but with a critical consciousness of its selective nature and with an orientation of all relative perspectives to the whole, enables man to control and constructively utilize selective understanding, rather than it dominating and deluding him. The limitation of certain forms of understanding does not mean the limitation of human understanding as such. Selective and relative

viewpoints do not have meaning apart from the whole of reality, and thus they must point beyond themselves to the greater whole.

Different expressions of experience are necessary in a world of diverse and multi-faceted cultures, and the unique and vital contributions of each should be recognized. To understand experience, man follows different paths based on different presuppositions, which offer different descriptions of different aspects of life. Reality is perceived in various ways, and each perspective provides an original core of existential meaning. All perspectives are valid, although selective, and all express man's relatedness to the whole of reality.

Variety and exposure to other viewpoints are essential to man's vitality, creativity and growth. An integrated approach that explores many perspectives as opposed to the monopoly of one is stimulating and adds dimensions of openness and tolerance to man's understanding. The different insights of different understandings can be brought together in a creative and dynamic interrelation that leads to a deeper awareness than that achieved by the non-necessary assumptions of a single perspective. Meaningful intercommunication, that overcomes sectarianism and the pursuit of group interests, can lead to mutual learning and genuine novel insights. In such an atmosphere of intellectual freedom, the emphasis is placed on the whole, not the vehicle to it.²⁸¹

A point of contact is established when it is recognized that each viewpoint presents a selective understanding of reality and, as a relative perspective, each must point beyond itself to the whole of reality. Awareness of the specifics of each prevents reduction of one to the other. As each is only a path to the whole, no one vehicle

should be absolutized over the others. Banalities are avoided by not collapsing all perspectives into a simplistic, holistic totality. Each must retain its own methodology and epistemology, but each must accept it as limited. Being convinced by one perspective when all are regarded as aspects of something more fundamental is not intelligent.

Differentiation with dynamic interrelation creates tension and the challenge of breaking old patterns to arrive at new insights. Confronting the differences and contradictions of diverse perspectives results in recognizing the limitations of each perspective. Disrupting and interfering with the stabilizing forces and presuppositions of a given viewpoint helps to push through its inherent limitations to a deeper understanding. The stimulation of new perspectives can result in a creative synthesis and awareness of the whole of reality surpassing that of a single viewpoint.

A concern for the wholeness of reality brings man to the foundations of his models and symbols, to the ground of his selective understandings and to the depths of his being. By being open and critical, by keeping the boundaries of the possible supple and creatively breaking old patterns, man's awareness expands and deepens. Exploring the limitations of all selective understandings and their dangerous, dogmatic tendency to usurp the whole leads to an awareness of the whole lying beyond all selective expressions. Man should act responsibly. Through an orientation to the whole, he should be ready to face the consequences of this orientation and recognize the whole where it reveals itself. Man has a spiritual core of infinite potential that he need only realize to actualize. He has the potential to move beyond

the constraints of his ordinary understanding to the deeper meanings and ineffable freedom of the whole.

However, to break free of limited viewpoints, it is not enough to simply recognize their selectivity. The pull of the whole is also needed. Only the whole is absolutely real, while selectivity determines understandings which are only relatively real. The metamorphosis from selectivity to non-selectivity is not continuous, but is a leap from conditioned existence to transcendent oneness.

It is important to keep ideas relevant, to search for meaning applicable to current problems. Experience and understanding are continually changing, necessitating new configurations. No single expression of an understanding of reality is relevant for all people, for all time. The insights of the past cannot simply be repeated. They must be dynamically integrated with those of the present or they will become irrelevant. Stating and restating keeps insights alive and meaningful, and restatements must be made in each age to intelligently meet the challenges of the present worldviews, issues and concerns. It is necessary to adjust, evolve and expand to survive in a meaningful way. Thus, it is important to live with questions, to point to problematic areas and issues, rather than seeking final solutions. As the whole of reality cannot be captured in a single formula, continual restatements of understanding of existence, relevant to the changing experiences of man, and continual striving for more comprehensive re-orientations to the whole must be made.

In the modern western world, one of the important issues is harmoniously interrelating science and religion. Both science and

religion are vital components of modern culture. How the two relate is one of the questions which must be continually resought and restated if this culture is to grow and survive in a meaningful manner. By accepting the articulated understandings of both and dynamically interrelating their diverse perspectives, a deeper understanding of the whole and a common force in confronting the issues of today can be attained, beyond the possibilities either offer in isolation. Both science and religion have important and valid contributions to make to human existence, yet neither expresses the whole of existence. For genuine meaning, relevant for the diversity of modern culture, to be established, an orientation beyond single, selective understandings must be sought.

The frame of 'selective understandings of reality and the non-selective reality' provides a good basis for considering the nature of science and religion, their interrelationship and their relationship to the whole of reality. It enables a variety of expressed understandings of reality to be examined, western and eastern, religious and scientific, recognizing each as limited, and yet as providing vital insight into reality, and recognizing that each, by its selective nature, is orientated to the non-selective whole of reality. In such a context, no single viewpoint can absolutize itself over other perspectives or have pretensions of exhausting the possibilities of human understanding. Discussing a variety of perspectives provides the scope of insight required to adequately address a problem of such complexity and vastness as the relation of science and religion. It enables a deeper insight into the limitations and potentials of the

expressions of human understanding than that achieved by a particular perspective alone.

A general overview of several facets of western culture reveals the nature of selectivity. Selectivity enables abstracting an aspect of reality for particular constructive application without the bombardment of vast amounts of irrelevant information, ideas and experiences. However, each particular viewpoint is meaningful for only certain delimited areas of experience. When a given selective viewpoint dogmatically asserts that ~~is~~^t exhausts the possibilities of human understanding, man becomes a prisoner of that partial viewpoint and destructive contradictions arise. Thus, it is vital to be conscious and critical of the limited nature of all expressed understandings. Only the non-selective whole of reality is absolutely real. Each particular selective understanding is interesting only as far as it reveals the whole. Only by disrupting the boundaries of limited perspectives and orientating each selective viewpoint to the non-selective whole can the potentials of human insight be realized.

Nāgārjuna and Śāṅkara provide an explicit presentation of the selective nature of human understanding through a discussion of relative, conventional knowledge as distinguished from absolute knowledge. They disclose ~~of~~ the contradictions and suffering that result from ignorance obscuring true knowledge and causing bondage to relative knowledge. They provide a means to attain freedom from bondage to conventional knowledge through revealing its conditioned and limited nature, and negating it, to uncover absolute knowledge. These two philosophical religious systems provide a spiritual path to the depths

of human meaning and potential through the attainment of ultimate freedom and knowledge, but in an abstract and systematic manner that is comprehensible to western man, who is steeped in scientific and rational thought. The uniqueness of these presentations to the perspective of western man stimulates his insight into new directions.

Nāgārjuna and Śāṅkara discuss the limited and self-contradictory nature of all conditioned knowledge, and thus the impossibility of developing a consistent and complete description of the phenomenal world. However, western science seeks, through conceptual thought processes, to provide valuable knowledge and arrive at a meaningful cosmology. Nāgārjuna's and Śāṅkara's negation of what is the method and content of science does not invalidate its usefulness in limited contexts, but does reveal the falsity of any dogmatic pretensions it might entertain. Placing scientific enquiry and knowledge in the context of the greater whole of human understanding prevents the meaninglessness which often arises from confinement to a particular point of view. Though science provides selective understandings of reality, valid for only limited areas of experience, if it has an orientation to the whole of reality, it has great potential for human insight.

David Bohm's presentation of the abstracted aspect as opposed to the unbroken whole provides an appropriate concluding discussion. Influenced by eastern and religious thought, Bohm provides a discussion of the issues of scientific methodology and modern physics in a manner that expands their normal horizons. He demonstrates how a delimited area of science can be examined in detail more meaningfully if its place

in the context of the whole is delineated. In this manner Bohm is able to make modern physics more intuitively understandable and meaningful to modern man. He also discusses how the relationship of different levels of consciousness and of matter can be understood by regarding each as an aspect of a vaster whole. Bohm's discussion is comparable with Nāgārjuna's and Śāṅkara's presentations, but is from a different perspective and with a different emphasis. It thus provides a unique illumination of the frame of 'selective understanding of reality and the non-selective reality'.

I am aware of the inherent limitations of presenting 'selective understandings of reality and the non-selective reality' as a viable frame for the study of science and religion. The issues involved in such a study are numerous and complex, and the presentation here is in no way exhaustive. The thesis is simply a first attempt at an overview of the various problems and topics involved, each of which would require years of study to be treated adequately. However, before embarking on specific studies, it is important to have an understanding of the whole context in which particular issues arise. Once the general framework for the study of science and religion has been established, specialized research in delimited areas can be undertaken with an awareness of the relationship of these specific problems to the whole context in which they arise, and in a manner meaningful to the general concerns of man, rather than of importance to only a closed circle of fellow researchers. A continuous dialectic should be maintained between the general framework and specialized research, with the two interacting and developing together.

Several possible avenues of research could be undertaken within the frame of 'selective understandings of reality and the non-selective reality'. The western treatments of language, thought, models of the self and religious traditions could be individually examined with a comparison to and partial integration with the unique Buddhist and Vedāntic treatment of these facets of existence, to arrive at a more profound understanding of each of these facets. An attempt could be made to present Buddhist or Vedāntic thought in a manner explicitly meaningful to the western, scientific culture, and yet true to its original meaning. The methodology of various disciplines or methodological issues in general could be examined with explicit discussion of the limitations of selective understanding and the importance of orientating all partial understanding to the non-selective whole. Buddhist and Vedāntic insights into epistemological and methodological problems could be studied in conjunction with western considerations of these problems, to arrive at unique and penetrating insights. The cosmology of Buddhism and Vedānta could be explicitly examined together with general western considerations of cosmology, or with the specific cosmology of modern physics, to develop a broader understanding of cosmology and possibly develop a cosmology meaningful to both eastern and western cultures in the modern world. These are just a few possible directions in which research could embark from the frame of 'selective understandings of reality and the non-selective reality'.

The frame of 'selective understandings of reality and the non-selective reality' is, of course, presented from the perspective of

selectivity. However, it is hoped that through the examination of a diversity of perspectives, western and eastern, religious and scientific, a level of understanding is attained beyond that of a single perspective. The selectivity of man's particular points of view has been examined to reveal the dangers of misconstruing a particular viewpoint for the whole of understanding, and the constructive and meaningful roles of particular insights when they orientate their selectivity to the non-selective whole of reality. The frame provides a foundation for confronting the issues of utmost concern to the modern scientific culture, that is finding meaning in life relevant to both of the two vital components of this culture, science and religion.

FOOTNOTES

1. The terms 'selective' and 'non-selective' are taken from George Melhuish, The Paradoxical Nature of Reality (Bristol: St. Vincent's Press, 1973). However, while Melhuish indicates a quantitative distinction between selectivity and non-selectivity, I intend a fundamental difference in awareness. The terms 'selective' and 'non-selective' are of limited validity, but are the best expressions of the ideas presented in this thesis I could find within the english language. It is hoped that through reading the thesis the concepts intended by these terms will come to be understood.
I must also apologize for the frequent use of the word 'reality' throughout the thesis. The term is not used casually, nor with pretension, but simply because no other word is adequate in the given context. As the discussion of the thesis varies from chapter to chapter, and as the thought of different individuals is discussed, subtle but important distinctions in the intended meaning of the word 'reality' arise. The reader is advised to pay close attention to the context within which the word is used, and to draw its meaning from that context.
2. K.K. Klostermaier, "From Phenomenology to Metascience: Reflections on the Study of Religions," Studies In Religion 6:5 (1976-77): 560.
3. Ian G. Barbour, Myths, Models and Paradigms (New York: Harper and Row, 1974), pp. 55-56; Kim Malville, A Feather for Daedalus (Reading, Massachusetts: Cummings Publishing Company, Inc. 1975), p. 111; and John A. Schumacher, "The Place of Freedom in Life: Some Models of a Human Being," Philosophical Social Science 10 (1980): 352.
4. David Bohm, "Human Nature as a Product of Our Mental Models," in The Limits of Human Nature, ed. Jonathon Tenthall (New York: E.P. Dutton & Co., Inc., 1974), p. 92; Beatrice Bruteau, "The Grid Maker," Fields Within Fields (Winter 1975): 43; Idem., The Psychic Grid (Wheaton, Ill.: The Theosophical Publishing House, 1979), pp. 92-102; Schumacher, "Place of Freedom in Life," p. 360; and Paul Watzlawick, How Real is Real? (New York: Vintage Books, 1976), pp. 18-19.
5. Bohm, "Human Nature", p. 92; Bruteau, "The Grid Maker," pp. 44-45; and Idem., The Psychic Grid; pp. 1-14, 52-53 and 92-95. Watzlawick, How Real is Real?, describes in detail several experiments where individuals came to disbelieve their own perceptions in the face of group pressure (see pp. 76-92).

6. Bohm, "Human Nature," pp. 113 and 107; and Bruteau, The Psychic Grid, pp. 96-102 and 181-196.
7. Bruteau, "The Grid Maker," p. 45; and Idem., The Psychic Grid, pp. 16-22, 40-52 and 60-82. The phrase 'psychic filter' is used by Bruteau throughout her writings.
8. Bruteau, The Psychic Grid, pp. 1-14 and 107-115; Malville, A Feather for Daedalus, p. 78; Joseph Chitton Pearce, The Crack in The Cosmic Egg (Richmond Hill, Canada: Simon and Schuster of Canada, 1968), pp. 113 and 132; and Watzlawick, How Real is Real?, pp. 54 and 74-92.
9. Bruteau, The Psychic Grid, pp. 10-14, 52-53 and 115-116; and Juergen Habermas, Knowledge and Human Interests, trans. Jeremy J. Shapiro (Boston: Beacon Press, 1971), pp. 219, 223, 227, 240, 243 and 257.
10. Bohm, "Human Nature," pp. 112-113; Bruteau, "The Grid Maker," p.44; Idem., The Psychic Grid, pp. 13-14, 115-121 and 192-226; and Schumacher, "Place of Freedom in Life," pp. 363-364 and 374-376.
11. Barbour, Myths, Models and Paradigms, p.4; Bruteau, The Psychic Grid, pp. 83-96; Klostermaier, "From Phenomenology to Metascience," p. 556; V.V. Nalimov, In the Labyrinths of Language: A Mathematician's Journey (Philadelphia: Isi Press, 1981), pp. 24 and 202; Watzlawick, How Real is Real?, p. xi; and Benjamin Lee Whorf, Language, Thought and Reality, ed. John B. Carroll (M.I.T.P., 1956).
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128. Dasgupta, A History of Indian Philosophy, vol. I, p. 451; Mahadevan, Advaita in the Visnu-Purāna, pp. 18 - 20; Nikhilanda, Māndūkyopaniṣad, p. 99; and Thibaut, Introduction Vedānta Sūtras of Bādarāyana, pp. xxv - xxvi.
129. K. Bhattacharyya, "Advaita," pp. 248 - 249; Dasgupta, A History of Indian Philosophy, vol. I, p. 438; Nikhilanda, Introduction to Self-Knowledge, pp. 57 - 61 and 67; and Thibaut, Introduction to Vedānta Sūtras of Bādarāyana, p. xxvii.
130. K. Bhattacharyya, "Advaita," pp. 248 - 249; Lyer, "The Philosophy of Advaita," pp. 32 - 33; Mahadevan, Advaita in the Visnu-Purāna, pp. 9 - 10; Nikhilanda, Introduction to Self-Knowledge, pp. 38 - 40; and Thibaut, Introduction to Vedānta Sūtras of Bādarāyana, p. xxxii.
131. S. Bhattacharya, "Śaṅkara," p. 242; Dasgupta, A History of Indian Philosophy, pp. 439 and 438; Mahadevan, Advaita in the Visnu Purāna, p. 21; Nikhilanda, Māndūkyopaniṣad, p. 152; Idem., Introduction to Self-Knowledge, pp. 58, 60 - 62 and 70 - 74; and Thibaut, Introduction to Vedānta Sūtras of Bādarāyana, pp. liii-lviii.
132. S. Bhattacharya, "Śaṅkara," pp. 237 - 238; Dasgupta, A History of Indian Philosophy, vol. I, pp. 451 - 452; Ibid., vol. II, p. 104; Jagadananda, A Thousand Teachings, pp. 5 - 6 and 66; and Thibaut, Introduction to Vedānta Sūtras of Bādarāyana, p. xxvi.
133. K. Bhattacharyya, "Advaita," pp. 246 - 247.
134. S. Bhattacharya, "Śaṅkara," p. 240 - 1 and 243; Dasgupta, A History of Indian Philosophy, vol. I, pp. 438, 441 and 489; Ibid., vol. II, p. 35; Mahadevan, Advaita in the Visnu-Purāna, pp. 11 and 18 - 19; Nikhilanda, Māndūkyopaniṣad, pp. 65 and 100; Idem., Introduction to Self-Knowledge, p. 62; and Thibaut, Introduction to Vedānta Sūtras of Bādarāyana, pp. lxiv - v.

135. S. Bhattacharya, "Śaṅkara," p. 242; and Mahadevan, Advaita in the Viṣṇu-Purāna, pp. 11, 13, 14 and 18.
136. S. Bhattacharya, "Śaṅkara," p. 237 - 239; Dasgupta, A History of Indian Philosophy, vol. I, pp. 474 - 475; and Nikhilanda, Māṇḍūkyopaniṣad, p. 98.
137. S. Bhattacharya, "Śaṅkara," p. 239; Dasgupta, A History of Indian Philosophy, vol. I, pp. 447 - 451, 471 - 474 and 481 - 482; and Jagadananda, A Thousand Teachings, pp. 47, 61, 95, 122, 124, 130, 139 and 257.
138. S. Bhattacharya, "Śaṅkara," p. 239; Dasgupta, A History of Indian Philosophy, vol. I, pp. 445 - 446 and 474; and Jagadananda, A Thousand Teachings, pp. 130, 137, 214 and 217 - 218.
139. S. Bhattacharya, "Śaṅkara," p. 239; Dasgupta, A History of Indian Philosophy, p. 474; and Jagadananda, A Thousand Teachings, pp. 40 and 47.
140. S. Bhattacharya, "Śaṅkara," p. 241; Jagadananda, A Thousand Teachings, p. 39; and Lyer, "Philosophy of Advaita," p. 220.
141. Theodore de Bary, ed., Sources of Indian Tradition (New York: Columbia University Press, 1970), p. 31; K. Bhattacharya, "Advaita," pp. 246 - 247; Dasgupta, A History of Indian Philosophy, vol. I, pp. 450 and 458 - 459; Jagadananda, A Thousand Teachings, p. 224; and Lyer, "Philosophy of Advaita," p. 221.
142. Dasgupta, A History of Indian Philosophy, vol. I, p. 460; Jagadananda, A Thousand Teachings, pp. 71 and 119; and Thibaut, Introduction to Vedānta Sūtras of Bādarāyana, p. xxvi.
143. K. Bhattacharyya, "Advaita," pp. 246 - 247; Jagadananda, A Thousand Teachings, pp. 229 - 230; and Nikhilanda, Māṇḍūkyopaniṣad, p. 99.
144. K. Bhattacharyya, "Advaita," pp. 246 - 247; Frederica, "To Advaita Through Nuclear Physics," p. 165; and Nikhilanda, Māṇḍūkyopaniṣad, p. 106.

145. S. Bhattacharya, "Śaṅkara," p. 238; Nikhilanda, Māṇḍūkyopaniṣad, p. 2; and Thibaut, Introduction to Vedānta Sūtras of Bādarāyana, p. xxvi.
146. K. Bhattacharyya, "Advaita," p. 246; Dasgupta, A History of Indian Philosophy, vol. I, pp. 447 and 451; and Nikhilanda, Māṇḍūkyopaniṣad, pp. 117 and 242.
147. Jagadananda, A Thousand Teachings, pp. iii, 21, 23, 42, 104, 133, 151, 163, 217 and 278.
148. S. Bhattacharya, "Śaṅkara," p. 241; and Dasgupta, A History of Indian Philosophy, vol. I, p. 241.
149. S. Bhattacharya, "Śaṅkara," pp. 241 - 242; K. Bhattacharyya, "Advaita," pp. 247 - 248; Dasgupta, A History of Indian Philosophy, vol. I, pp. 454 and 470; Jagadananda, A Thousand Teachings, pp. 214 and 216; and Nikhilanda, Introduction to Self-Knowledge, pp. 49 - 52.
150. S. Bhattacharya, "Śaṅkara," pp. 241 and 244; and Dasgupta, A History of Indian Philosophy, vol. I, pp. 452 - 454.
151. S. Bhattacharya, "Śaṅkara," p. 244; and Dasgupta, A History of Indian Philosophy, vol. I, p. 487.
152. V. Subrahmanya Lyer, "The Essentials of Vedānta," in The Cultural Heritage of India, ed. Haridas Bhattacharyya (Hollywood: Vedanta Press, 1969), p. 216; and Nikhilanda, Māṇḍūkyopaniṣad.
153. Dasgupta, A History of Indian Philosophy, vol. I, p. 476; Jagadananda, A Thousand Teachings, pp. 133 and 198; Lyer, "Philosophy of Advaita," pp. 220 - 223; and Nikhilanda, Mandukyopaniṣad, pp. 1 - 84.
154. Dharmaraja Adhvarin, Vedāntaparibhasa, trans. S.S. Suryanarayana (Sastri Adyar, Madras, India: The Adyar Library and Research Centre, 1971), pp. 223 - 226; Dasgupta, A History of Indian Philosophy, vol. I, p. 476; Jagadananda, A Thousand Teachings, pp. 123 and 198; and Nikhilanda, Māṇḍūkyopaniṣad, pp. 1 - 84.

155. Adhvarin, Vedāntaparibhasa, pp. 226 - 230; Dasgupta, A History of Indian Philosophy, vol. I, p. 476; Jagadananda, A Thousand Teachings, pp. 53 and 135; and Nikhilanda, Māṇḍūkyopaniṣad, pp. 1 - 84.
156. Adhavarin, Vedāntaparibhasa, p. 216; Dasgupta, A History of Indian Philosophy, vol. I, p. 488; Lyer, "Philosophy of Advaita," pp. 221 and 230-232; and Nikhilanda, Māṇḍūkyopaniṣad, pp. 250-257.
157. Lyer, "Philosophy of Advaita," pp. 230-232.
158. Swami Agamanda, Introduction to Quintessence of Vedānta, trans. Swami Tattwananda (Hollywood: Vedanta Press, 1970), pp. xxxii - xxxiii; Lyer, "Philosophy of Advaita," p. 221; Nikhilanda, Māṇḍūkyopaniṣad, pp. xx and 180-181; Idem., Introduction to Self-Knowledge, p. 87; and Thibaut, Introduction to Vedānta Sūtras of Bādarāyana, p. lxiv.
For a fundamental treatise on Advaita epistemology, see: Adhavarin, Vedāntaparibhasa.
159. Agamanda, Introduction to Quintessence of Vedānta, p. xxxvi; Lyer, "Philosophy of Advaita," p. 235; Lyer, "The Essentials of Vedānta," p. 217; Nikhilanda, Māṇḍūkyopaniṣad, pp. i, iv, vi, x, xv, xvii-xviii and 49; and R.D. Ranade, A Constructive Survey of Upanishadic Philosophy (Bombay: Bharatiya Vidya Bhavan, 1968), p. 159.
160. Jagadananda, A Thousand Teachings, pp. 78, 118, 145, 148, 202 and 212; and Nikhilanda, Māṇḍūkyopaniṣad, pp. i, iv, vi, x, xv, xvii-xviii and 181.
161. Jagadananda, A Thousand Teachings, pp. 93 and 211; and Nikhilanda, Māṇḍūkyopaniṣad, pp. 45 and 65.
162. Lyer, "The Essentials of Vedānta," p. 217; and Nikhilanda, Māṇḍūkyopaniṣad, p. 49.
163. S. Bhattacharya, "Śaṅkara," pp. 241-242; K. Bhattacharyya, "Advaita," p. 249; and Nikhilanda, Māṇḍūkyopaniṣad, p. 49.
164. S. Bhattacharya, "Sankara," p. 238; Nikhilanda, Māṇḍūkyopaniṣad, pp. 34, 49 and 67; Idem., Introduction to Self-Knowledge, p. 56; and Thibaut, Introduction to Vedānta Sūtras of Bādarāyana, p. lxxviii.

165. Dasgupta, A History of Indian Philosophy, vol I, pp. 442 and 491; and Jagadananda, A Thousand Teachings, pp. 74 and 187.
166. Agamanda, Introduction to Quintessence of Vedānta, p. xxxv; K. Bhattacharyya, "Advaita," p. 250; Jagadananda, A Thousand Teachings, pp. 95 - 99 and 107; and Thibaut, Introduction to Vedānta Sūtras of Bādarāyana, p. ixii.
167. Adhvarin, Vedāntaparibhasa, p. xx; S. Bhattacharya, "Śaṅkara," pp. 237 and 241; Lyer, "Philosophy of Vedānta," p. 236; Nikhilanda, Māṇḍūkyaopaniṣad, p. xviii; and Idem., Introduction to Self-Knowledge, pp. 96 - 97.
168. Agamanda, Introduction to Quintessence of Vedānta, p. xxxviii; S. Bhattacharya, "Śaṅkara," p. 237; Dasgupta, A History of Indian Philosophy, p. 436; Lyer, "The Essentials of Vedānta," p. 213; Nikhilanda, Māṇḍūkyaopaniṣad, pp. x - xi and 2; and Idem., Introduction to Self-Knowledge, pp. 6 - 8.
169. S. Bhattacharya, "Śaṅkara," pp. 237 and 240 - 241.
170. Dasgupta, A History of Indian Philosophy, vol. I, p. 434; Jagadananda, A Thousand Teachings, p. 177; and Nikhilanda, Māṇḍūkyaopaniṣad, pp. 213 and 217 - 219. For numerous examples of the refutation of false doctrines see: Jagadananda, A Thousand Teachings; and Nikhilanda, Māṇḍūkyaopaniṣad.
171. Jagadananda, A Thousand Teachings, p. 5.
172. Dasgupta, A History of Indian Philosophy, pp. 489 - 490; Jagadananda, A Thousand Teachings, pp. 128 and 195; Lyer, "The Essentials of Vedānta," pp. 212 - 214; Nikhilanda, Introduction to Self-Knowledge, pp. 33 - 36; and Ranade, Survey of Upanishadic Philosophy, pp. 241 - 242.
173. Jagadananda, A Thousand Teachings, pp. 221 and 244.
174. Dasgupta, A History of Indian Philosophy, p. 491; Nikhilanda, Māṇḍūkyaopaniṣad, p. 1; and Idem., Introduction to Self-Knowledge, pp. 102 - 103.

175. Mahadevan, Advaita in The Viṣṇu-Purāna, p. 14; Nikhilanda, Māṇḍūkyopaniṣad, p. 14; and Ranade, Survey of Upanishadic Philosophy, pp. 159 - 160.
176. S. Bhattacharya, "Śaṅkara," p. 240; K. Bhattacharyya, "Advaita," p. 249; Mahadevan, Advaita in The Viṣṇu-Purāna, p. 9; and Nikhilanda, Introduction to Vedānta Sūtras of Bādarāyana, pp. xxv and lxii.
177. Nikhilanda, Māṇḍūkyopaniṣad, p. 311; and Idem., Introduction to Self-Knowledge, pp. 107 - 109.
178. Jagadananda, A Thousand Teachings, pp. 82, 105, 206 and 251; Lyer, "Philosophy of Advaita," pp. 230 - 232; and Nikhilanda, Māṇḍūkyopaniṣad, pp. 1 and 27.
179. Nikhilanda, Māṇḍūkyopaniṣad, pp. 138 - 139, 190 - 191 and 195; Idem., Introduction to Self-Knowledge, pp. 107 - 109; and Ranade, Survey of Upanishadic Philosophy, p. 158.
180. Agamanda, Introduction to the Quintessence of Vedānta, p. xxxv; K. Bhattacharyya, "Advaita," p. 250; Jagadananda, A Thousand Teachings, pp. 47, 51, 154, 191, 221 and 225; Ranade, Survey of Upanishadic Philosophy, p. 158; and Thibaut, Introduction to Vedānta Sūtras of Bādarāyana, p. lxxii.
181. Adhvarin, Vedāntaparibhasa, p. 155; and Mahadevan, Advaita in the Viṣṇu-Purāna, p. 28.
182. S. Bhattacharya, "Śaṅkara," p. 237; K. Bhattacharyya, "Advaita," pp. 249 - 250; Jagadananda, A Thousand Teachings, pp. 135, 132, 148, 153, 175 - 176 and 181; Nikhilanda, Māṇḍūkyopaniṣad, p. 286; and Ranade, Survey of Upanishadic Philosophy, pp. 222 - 224.
183. Thomas S. Kuhn, The Structure of Scientific Revolutions, 2nd. ed. (Chicago: University of Chicago Press, 1973).
184. Ibid., p. viii.
185. Barbour, Myths, Models and Paradigms; Kuhn, Scientific Revolutions; and Nalimov, In The Labyrinths of Language, pp. 81 and 96.

186. Barbour, Myths, Models and Paradigms; H.I. Brown, "Problem Changes," pp. 117 - 192; R.H. Brown, "The Nature of Science," pp. 201 - 215; Kuhn, Scientific Revolutions; and Malville, A Feather For Daedalus.
187. Barbour, Myths, Models and Paradigms; H.I. Brown, "Problem Changes," pp. 117 - 192; R.H. Brown, "The Nature of Science," pp. 201 - 215; and Kuhn, Scientific Revolutions.
188. Barbour, Myths, Models and Paradigms, p. 113; and Kuhn, Scientific Revolutions, pp. 80, 137 and 140.
189. 'Normal Science' is a phrase coined by Thomas Kuhn. See: Kuhn, Scientific Revolutions.
190. Barbour, Myths, Models and Paradigms; H.I. Brown, "Problem Changes," pp. 191 and 184 - 186; and Kuhn, Scientific Revolutions.
191. Bohm, Wholeness and The Implicate Order, pp. 6 and 15 - 16; and Melhuish, The Paradoxical Nature of Reality, p. 53.
192. Bruteau, The Psychic Grid; Kuhn, Scientific Revolutions; Watzlawick, How Real is Real? p. 50; and Weizsaecker, The Unity of Nature, p. 192.
193. Habermas, Knowledge and Human Interests, pp. 67 - 69, 84, 161, and 308; Heisenberg, Physics and Beyond, p. 206; Planck, Scientific Autobiography, pp. 168 - 171; and Håkan Törnebohm, gen. ed., Studies in the Theory of Science (Goteborg; Akademiförlaget, 1970), Contemporary Schools of Metascience, by Gerald Radnitzky, p. 11.
194. Burckhardt, "Cosmology and Modern Science," pp. 127 - 129; Habermas, Knowledge and Human Interests, pp. 96 and 196; Werner Heisenberg, "Tradition in Science," Dialogue 7:1 (1974): 46-56; and Ravinda, "Western Science and Technology," pp. 8-16.
195. Habermas, Knowledge and Human Interests, p. 68; Idem., "A Positivistically Bisected Rationalism," trans. G. Adry and D. Frisby, in The Positivist Dispute in German Sociology, eds. David Frisby and Glyn Adry (London: Heinemann Educational Books Ltd., 1976), pp. 206-207; and Heisenberg, "Traditions in Science," pp. 50-51.

196. Habermas, Knowledge and Human Interests, p. 4; Idem., Toward a Rational Society: Student Protest, Science and Politics, trans. Jeremy J. Shapiro (Boston: Beacon Press, 1970), pp. 60, 98, 105 and 107; Idem., Theory and Practice, trans. John Viertel (Boston: Beacon Press, 1970), p. 254; and Radnitzky, Contemporary School of Metascience, pp. 5 and 133-137.
197. R. H. Brown, "The Nature of Science," pp. 202 - 203; Conze, Further Buddhist Studies, pp. 93-112; Feyerabend, Against Method, pp. 43-4; Habermas, Toward a Rational Society, pp. 81-122; Melhuish, The Paradoxical Nature of Reality, pp. 28 and 48-49; and Weizsaecker, The Unity of Nature, pp. 286-289.
198. Habermas, Knowledge and Human Interests, p. 67; Idem., "A Positivistically Bisected Rationalism," p. 207; Radnitzky, Contemporary Schools of Metascience, pp. 136-138; and Trent Schroyer, "The Dialectical Foundations of Critical Theory: Juergen Habermas' Metatheoretical Investigations," Telos 12 (1972): 112 and 114.
199. Feyerabend, Against Method; Juergen Habermas, "A Postscript to Knowledge and Human Interests," Philosophical Social Science 3 (1973): 163; Idem., "The Analytic Theory of Science and Dialectics," trans. G. Adry and D. Frisby, in The Positivist Dispute in German Sociology, eds. David Frisby and Glyn Adry, (London: Heinemann Educational Books Ltd., 1976), pp. 149-150 and 153; and Idem., "A Positivistically Bisected Rationalism," pp. 201-202 and 206-207.
200. Habermas, Theory and Practice, pp. 264 and 270-271.
201. Barbour, Myths, Models and Paradigms, pp. 107 and 109; Bohm, "Part A," p. 360; and Idem., "Part B," p. 140.
202. Bohm, "Part A," p. 362; H.I. Brown, "The Nature of Science," pp. 185-186; Bruteau, "The Grid-Maker," pp. 42-48; P.A.M. Dirac, "Development of The Physicist's Conception of Nature," in The Physicist's Conception of Nature, ed. J. Mehra (Reidell, 1973), pp. 12-14; Heisenberg, "Tradition in Science," pp. 54-55; Brendan O'Regan "A Comment" in "Implications of Metaphysics for Psychoenergetic Systems 1 (1974): 8; and Watzlawick, How Real is Real? pp. 50 and 81.

203. Bohm, "Part A," p. 360; Idem., "Part B," p. 141; Idem., "Issues in Physics, Psychology and Metaphysics," pp. 33-34; H.I. Brown, "Problem Changes," pp. 191-192; Dirac, "Physicist's Conception of Nature," p. 1; Malville, A Feather for Daedalus, pp. 51 and 55; and Polyani, Meaning, pp. 31-65 and 95-99.
204. Barbour, Myths, Models and Paradigms, p. 101; Bohm, "Part A," pp. 359 and 380; Idem., "Part B," p. 141; Feyerabend, Against Method; Kuhn, Scientific Revolutions; and Malville, A Feather Daedalus, pp. 96-97.
205. Barbour, Myths, Models and Paradigms, pp. 92-118; Bohm, "Part A," pp. 359 and 380; R.H. Brown, "The Nature of Science," pp. 204-205; Feyerabend, Against Method; and Heisenberg, "Tradition in Science," p. 54.
206. Barbour, Myths, Models and Paradigms, pp. 92-93, 106 and 118; Feyerabend, Against Method, and Kuhn, Scientific Revolutions, pp. 198 and 204.
207. Planck, Scientific Autobiography, pp. 33-34.
208. Bohm, Wholeness and The Implicate Order, p. 110; Feyerabend, Against Method, David McGoveran, "A Comment" in "Some Remarks on Sarfatti's Proposed Connection between Quantum Phenomena and the Volitional Activity of The Observer-Participant," by David Bohm Psychoenergetic Systems 1(1976): 180; Price, Science Since Babylon, p. 128.
209. Such a pure relativism is the conclusion to which Kuhn tends and Feyerabend arrives.
210. Barbour, Myths, Models and Paradigms, pp. 92-98 and 106-118; Heisenberg, Physics and Beyond, pp. 68-69; and Price, Science Since Babylon, 71-91.
211. Heisenberg, "Tradition in Science," p. 148.
212. Planck, Scientific Autobiography, p. 88.
213. R.H. Brown, "The Nature of Science," p. 210.

214. Heisenberg, "The Representation of Nature in Contemporary Physics," pp. 226-227 and 230-232.
215. R. H. Brown, "The Nature of Science," p. 209; Hoyle, Ten Faces of the Universe, p. 8; and Planck, Scientific Autobiography, pp. 80 and 105.
216. Heisenberg, "The Representation of Nature in Contemporary Physics," pp. 229-332.
217. Nalimov, In the Labyrinths of Language, pp. 50-51; O'Regan, "A Comment," in "Implications of Metaphysics for Psychoenergetic Systems," by Jack Sarfatti; p. 217; and Watzlawick, How Real is Real?, pp. 195-203.
218. Barbour, Myths, Models and Paradigms, p. 211; Dirac, "Development of a Physicist's Conception of Nature," p.1; and Heisenberg, "Tradition in Science," p. 50.
219. Bohm, "Part A," p. 367; Fritjof Capra, The Tao of Physics (Berkeley: Shambala Publications Inc., 1975), pp. 56-62; and Heisenberg, "The Representation of Nature in Contemporary Physics," pp. 215-232.
220. The theories of modern physics are only briefly sketched here. For a more detailed discussion of relativity theory see: Arthur Beiser Perspectives of Modern Physics (Toronto: McGraw - Hill Book Company, 1969), pp. 30-51; Bohm, "Part A," pp. 368-372; Dirac, "Development of a Physicist's Conception of Nature," pp. 1-14; Heisenberg, Physics and Beyond; and M. Russell Wehr and James A. Richards, Jr., The Physics of the Atom, 2nd. ed. (Don Mills, Ontario: Addison-Wesley Publishing Company, 1967), pp. 135-177. For a general discussion of relativity theory see: Capra, The Tao of Physics, pp. 168-187, 206-212 and 218-220; Hoyle, Ten Faces of the Universe; Malville, A Feather for Daedalus, pp. 20-52; Michael Talbot, Mysticism and the New Physics (New York: Bantam Books, Inc., 1980), pp. 75-77 and 80; Idem. and Lloyd Biggle, "Quantum Physics and Reality," Analog Science Fiction/Science Fact 12 (1976): 47-57; and Gary Zukav, The Dancing Wu Li Masters (New York: William Morrow and Company, Inc., 1979), pp. 140-207.

221. For a detailed discussion of quantum theory see: Beiser, Perspectives of Modern Physics; Bohm, "Part A," pp. 372-379; Idem., Wholeness and the Implicate Order, pp. 66-76; Idem., and B. J. Hiley, "On The Intuitive Understanding of Non-Locality as implied by Quantum Theory," Foundations of Physics 5:1 (1975): 94-101; Idem., "Sarfatti's Proposed Connection," pp. 173-179; Dirac, "Development of a Physicist's Conception of Nature," pp. 1-14; Robert Eisberg and Robert Resnick, Quantum Physics of Atoms, Solids, Nuclei and Particles (Toronto: John Wiley and Sons, 1974); Frederica, "To Advaita through Nuclear Physics," pp. 162-170; Heisenberg, Physics and Beyond; Idem., "The Representation of Nature in Contemporary Physics," pp. 215-232; Planck, Scientific Autobiography; Wehr, The Physics of the Atom; and Carl Fredrich von Weizsaecker, "Who is The Knower in Physics?" in Spiritual Perspectives, ed. T.M.P. Mahadevan (New Delhi: Arnold Heinemann Publishers, 1975), pp. 145-161.
- For a general discussion of quantum theory see: Capra, The Tao of Physics, pp. 135-145; Hoyle, Ten Faces of The Universe; Malville, A Feather for Daedalus, pp. 20-52 and 123-127; Talbot, Mysticism and The New Physics, pp. 21-41 and 70-74; Idem., "Quantum Physics and Reality," pp. 47-57; and Zukav, The Dancing Wu Li Masters, pp. 40-47, 52-136 and 270-310.
222. Capra, The Tao of Physics, pp. 187-195 and 213-214; B.K. Ridley, Time, Space and Things (Penguin Books, 1976), pp. 104-111; and Zukav, The Dancing Wu Li Masters, pp. 210-267.
223. Nalimov, In The Labyrinths of Language, p. 126.
224. Ibid.
225. Bohm, Wholeness and The Implicate Order, pp. 67-72; Idem., "Intuitive Understanding of Non-Locality," pp. 10; and Planck, Scientific Autobiography, pp. 120-150.
226. Capra, The Tao of Physics, pp. 135-141; Heisenberg, Physics and Beyond, pp. 12-32; Weizsaecker, The Unity of Nature, pp. 182-189; and Zukav, The Dancing Wu Li Masters, pp. 103-111.
227. Bohm, "Sarfatti's Proposed Connection," p. 175; Weizsaecker, The Unity of Nature, pp. 184, 187 and 342-345; and Zukav, The Dancing Wu Li Masters, pp. 116-127.

228. Heisenberg, Physics and Beyond; Idem., "The Representation of Nature in Contemporary Physics," pp. 215-232; Idem., "Scientific Truth and Religious Truth," pp. 1-14; Idem., "Tradition in Science," pp. 46-56; and Zukav, The Dancing Wu Li Masters, pp. 131-136 and 262-267.
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230. Dean R. Fowler, "Einstein's Cosmic Religion," Zygon 14:3 (1974): 267-278; Roy D. Monison II, "Albert Einstein: The Methodological Unity Underlying Science and Religion," Zygon 14:3 (1979): 255-266; and Zukav, The Dancing Wu Li Masters, pp. 43, 63, 301 and 376.
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233. Capra, The Tao of Physics, p. 145; and John Archibald Wheeler, "From Relativity to Mutability," in Spiritual Perspectives, ed. T.M.P. Mahadevan (New Delhi: Arnold Heinemann Publishers, 1975), pp. 203-247.

234. Sarfatti, "Implications of Metaphysics for Psychoenergetic Systems," pp. 177-185; Idem., "Letters to The Editor," Psychoenergetic Systems 2(1977):177-185; Idem., "The Physical Roots of Consciousness," in The Roots of Consciousness: Psychic Liberation through History Science and Experience, ed. Jeffrey Mishlove (Random House, 1975), pp. 279-293; Idem., "Some Considerations towards a Physical Theory of Paranormal Phenomena," Psychoenergetic Systems 3(1979): 351-356; John A. Schumacher, "A New Place for Persons in Physics and Life," Psychoenergetic Systems 4(1981): 47-66; Talbot, Mysticism and the New Physics, pp. 36, 40, 77-78, 94, 110 and 125; Idem., "Quantum Physics and Reality," pp. 47-57; and Zukav, The Dancing Wu Li Masters, pp. 310-314.
235. Nalimov, In the Labyrinths of Language, p. 131.
236. Dirac, "Development of A Physicist's Conception of Nature," pp. 11 and 14; and McGoveran, "A Comment," in "Sarfatti's Proposed Connection," by David Bohm, p. 180.
237. The distinction of implicate and explicate is found in the writings of Nicolas Cusanus. See: Nikolaus von Kues, "De docta ignorance," in Philosophisch - Theologische Schriften (Verlag Herder Wien, 1964), pp. 366 and 372 ff. As Nicolas Cusanus is a Neoplatonic thinker, there is a suggestion of an influence of the Neoplatonic tradition on David Bohm. See: Renée Weber, "The Physicist and the Mystic - Is a Dialogue Between them Possible? A Conversation with David Bohm," in The Holographic Paradigm and Other Paradoxes, ed. Ken Wiber (London: Shambala, 1982), p. 207.
238. Bohm, Wholeness and the Implicate Order, pp. 1-8 and 15-18.
239. Idem., "Part A," pp. 302-306.
240. Idem., "Part B," p. 141.
241. Ibid., pp. 140-142.
242. Bohm uses 'relevate' as a verb possessing the same root as the word relevant. He defines relevate as to stand out in relief. See: Bohm, "Part B," pp. 149-150.
243. Bohm, "Part B," pp. 149-150 and 155; and Idem., Wholeness and the Implicate Order, p. 173.

244. Idem., "Part A," pp. 361, 367 and 370-1; and Idem., Wholeness and the Implicate Order, p. 173.
245. Idem., "Part A," pp. 368-377; Idem., Wholeness and the Implicate Order, pp. 173-175; and Idem. and Hiley, "Intuitive Understanding of Non-Locality," pp. 93-101.
246. Idem., "Part A," pp. 377-378; Idem., Wholeness and the Implicate Order, p. 176; and Idem., "Intuitive Understanding of Non-Locality," pp. 106-107.
247. Idem., "Part A," pp. 379-380; Idem., Wholeness and the Implicate Order, p. 176; and Schumacher, "In Defense of Mystical Science," p. 84.
248. Bohm, Wholeness and the Implicate Order, pp. 69-76; Idem., "Intuitive Understanding of Non-Locality," pp. 93-95 and 101; Idem. and Weber, "The Enfolding-Unfolding Universe," pp. 31-32; and Idem. and Welwood, "Issues in Physics, Psychology and Metaphysics," p. 29.
249. Bohm, "Part B," pp. 146-152; Idem., Wholeness and the Implicate Order, pp. 178-179, and Idem., "Issues in Physics, Psychology and Metaphysics," p. 25.
250. Idem., "Part B," p. 148; Idem. Wholeness of the Implicate Order, p. 5; and Idem., "The Enfolding-Unfolding Universe," p. 33
251. This discussion is similar to the discussion of the manifest and nonmanifest in the Bhagavad-Gita. See: R.C. Zachner, trans., The Bhagavad-Gītā (New York: Oxford University Press, 1979), pp. 13-14 and chapters vii-x. This similarity draws attention to the influence of J. Krishnamurti; an Indian spiritual teacher, on David Bohm. See: J. Krishnamurti, The Awakening of Intelligence (New York: Avon Books, 1976); and Weber, "The Physicist and the Mystic," p. 207
252. Idem., "Part B," pp. 148-149; Idem., Wholeness and the Implicate Order, pp. 179 and 185; and Idem. "The Enfolding-Unfolding Universe," pp. 33-34 and 41-42.

253. Idem., "Intuitive Understanding of Non-Locality," p. 105; and Idem., "The Enfolding-Unfolding Universe," pp. 33 and 51.
254. Idem., "Part B," pp. 149 and 153-154; Idem., Wholeness and the Implicate Order, pp. 178 and 181; Idem., "The Enfolding-Unfolding Universe," pp. 26 and 44; and Idem., "Issues in Science, Psychology and Metaphysics," pp. 26-28.
255. Idem., "Part B," pp. 143 and 146; and Idem., Wholeness and the Implicate Order, p. 177.
256. Dennis Gabor, "Holography, 1968-71," Science 177: 4046 (1972): 229-300.
257. Bohm, "Part B," pp. 144-148; Idem., Wholeness and the Implicate Order, pp. 177-178; Idem., "The Enfolding-Unfolding Universe," p. 46; and Schumacher, "The Place of Freedom in Life," pp. 50-51.
258. Bohm, "Part B," pp. 145-146; Idem., Wholeness and the Implicate Order, p. 179; Idem. "The Enfolding-Unfolding Universe," p. 28; and Idem., "Issues in Physics, Psychology and Metaphysics," pp. 33-35.
259. Idem., "Part B," p. 149; and Idem., Wholeness and the Implicate Order, p. 178.
260. Idem., "Part B," p. 164; and Idem., "The Enfolding-Unfolding Universe," p. 46.
261. Idem., "Part B," pp. 148 and 150-153; Idem., Wholeness and the Implicate Order, pp. 179-183; Idem., "The Enfolding-Unfolding Universe," pp. 25-27; and Idem., "Issues in Physics, Psychology and Metaphysics," p. 25.
262. Idem., "Part B," pp. 152-153; and Idem., Wholeness and the Implicate Order, pp. 183-185.
263. Idem., Wholeness and the Implicate Order, pp. 186-188; and Idem., "Issues in Physics, Psychology and Metaphysics," p. 28.

264. Idem., Wholeness and the Implicate Order, pp. 188-189; Idem., "Intuitive Understanding of Non-Locality," p. 68; and Idem., "The Enfolding-Unfolding Universe," pp. 49-50.
265. Idem., "Part B," pp. 155-160.
266. Ibid., pp. 161-162.
267. Idem., Wholeness and the Implicate Order, pp. 66-110.
268. Idem., "Part B," pp. 162-166; and Idem., "Intuitive Understanding of Non-Locality," pp. 107-108.
269. Idem., Wholeness and the Implicate Order, pp. 106-108 and 110.
270. Idem., Wholeness and the Implicate Order, pp. 99-102; and Idem., "Intuitive Understanding of Non-Locality," pp. 102-106.
271. Idem. and Hiley, "Sarfatti's Proposed Connection," pp. 173-179; and Schumacher, "The Place of Freedom in Life," pp. 51-61.
272. Bohm, "Human Nature," pp. 92-114; Idem., Wholeness and the Implicate Order, pp. 197-207; Idem. and Krishnamurti, "On Intelligence," pp. 487-91; Bohm, "The Enfolding-Unfolding Universe," pp. 33-37; and Idem., "Issues in Physics, Psychology and Metaphysics," pp. 29-30.
273. Bohm, "Human Nature," pp. 92-114; Idem., Wholeness and the Implicate Order, pp. 4-8; Idem., "On Intelligence," pp. 487-491; Idem., "The Enfolding-Unfolding Universe," pp. 33-34; and Idem., "Issues in Physics, Psychology and Metaphysics," p. 30.
274. Idem., "On Intelligence," pp. 477-507; Idem., "The Enfolding-Unfolding Universe," pp. 34-36; and Idem., "Issues in Physics, Psychology and Metaphysics," pp. 31-33.
275. Bohm, Wholeness and the Implicate Order, pp. 207-213; Idem., "On Intelligence," pp. 497-498; Idem., "The Enfolding-Unfolding Universe," p. 33; and Idem., "Issues in Physics, Psychology and Metaphysics," pp. 28-29.

276. Idem., "Part B," pp. 147 and 164; and Schumacher, "A New Place for Persons in Physics and Life," pp. 83-85.
277. Bohm, "Part B," p. 154.
278. Idem., Wholeness and the Implicate Order, pp. 193-196.
279. Idem., "Part B," pp. 149 and 153-154; Idem., Wholeness and the Implicate Order, pp. 178, 181 and 213; Idem., "Intuitive Understanding of Non-Locality," pp. 104-105; Idem., "The Enfolding-Unfolding Universe," p. 51; and Idem., "Issues in Physics, Psychology and Metaphysics," pp. 27-28.
280. Bohm, Wholeness and the Implicate Order, p. ix.
281. Klostermaier, "From Phenomenology to Metascience," pp. 551-564.

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