Physical Science and the Philosophy of Organism of A. N. Whitehead

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Submitted for the degree of Doctor of Philosophy

to City University

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Philosophy Division

September 2001

FOREWORD

Dr David Scully unfortunately passed away before he could submit his thesis. His family worked hard to submit Dr Scully's thesis on time.

Two eminent philosophers Dr Joseph Sen and Professor Wolfe Mays examined the thesis and agreed that "the work that has been put into this thesis is enormous and a high level of scholarship has been attained". They further went on to say that "Scully has provided a comprehensive picture of the thought of a philosopher who is among those most difficult to read"

Dr Scully was awarded a Doctor of Philosophy in Philosophy on 27 November 2001. His degree certificate will be presented to his family at the Graduation ceremony on 22 May 2002.

The following typographical errors could not be corrected:

Page 8 Victor Lowe of Cambridge should read Victor Lowe of John Hopkins, Baltimore USA

Page14 1.8, delete 'from' after took

Page 17 1.11, change wander to be wonder

Page 21 1.9, change sate to state

Page 45 footnote 3 should be placed before footnote 2 and not before it

Page 48 1.14, is to be put after it in ' it reasonable'

Page 50 Note 4 should go at the bottom of page 49

Page 89 1.12 'Heisneberg' should read Heinsenberg

Page 91 1.1 'of' to be put in after study

Page 91 1.11 'cleart' to be clearly

Page 92 1.6 from bottom - 'Principle of Relativity' should be The Principle of Relativity

Page 102 1.10 from bottom - substitute 'and' for 'the' in abandoned the failed

Page 129 Footnote 5 'R' should be PR

Page 161 1.12 from bottom - 'likelyhood' to be likelihood

Page 178 1.13 delete 's' after objects

Page 179 Note 5 'metaphysics' should be 'Metaphysics'

Page 182 1.13 'section' to be sections

Page 197 1.16 'fact' to be facts

Page 219 1.8 from bottom - delete 228

Page 222 1.13 'plane' to be plain'

Page 225 1.5 from bottom – 'distinguishing' to be distinguish

Page 240 1.11 from bottom – 'monadology' to be Monadology

Page 264 Footnote 4 '19' to read 1958

Professor Julius Weinberg
Pro - Vice Chancellor for Research
13 December 2001

Contents

Acknowledgements

I would like to thank Dr. Ali Benmakhlouf and Prof. Jean Seidengart for inviting me to participate in a Whitehead Workshop at the Department of Philosophy, Paris X - Nanterre and Dr. Jan Van de Veken, Chair of the European Society for Process Thought, for inviting me to submit papers to Whitehead Workshops in Kortrijk and Leuven. Contact with other Whitehead students was most helpful. Thanks for reading my script through go to Ann Saxby.

Special thanks are due to Dr. Alfons Grieder for his patience, encouragement and advice in assisting me in my work and for his continued faith in my ability to complete this thesis.

Declaration

I grant powers of discretion to the University Librarian to allow this thesis to be copied for study purposes only, in whole or in part, without further reference to me. This permission covers only single copies and is subject to normal conditions of acknowledgement.

Abstract

The Thesis commences by considering Whitehead's case for enlarging the breadth of the remit for the foundations of a philosophical cosmology, from the narrow abstraction of the single science of physics, to one which includes all the sciences including the social sciences and religion. The case includes Whitehead's belief that failure to enact these changes will lead to the emasculation of 'science' in its ability to contribute to the production of any philosophical cosmology.

The contribution of broadening the remit will be in the addition of the notion of value, for the new knowledge and understanding will be in terms of our experience of the cosmos, which represents the concrete facts available to us for the formulation of the general principles. Such a step is demonstrated as important in order to establish a 'provisional realism' based upon an organological philosophy.

In order to achieve these goals Whitehead's appeal to metaphysics is be traced as he establishes his 'world view'. His recourse to metaphysics and an analysis of their nature and development in his philosophy of organism will be found to play a significant role in the development of his philosophy, as metaphysics are utilised in the main task of the philosophy which is recognised as elucidating the concept of nature as it presents itself to us. Whitehead's method of investigation is based upon speculative philosophy which is a form of philosophical generalisation, and is considered as a means of achieving the aims and goals which Whitehead has set out.

The consequence of Whitehead's philosophy is seen as putting the world back together after the separation it suffered through the abstractions resulting from earlier scientific philosophical analysis. The dichotomy between mind and matter is removed while descriptions and explanations of life and consciousness are formulated. This is achieved through the construction of Whitehead's philosophy of organism, the purpose of which is to reinstate purpose and meaning to our philosophical cosmology. As a result the philosophy offers insight into scientific investigations into the reality of the world, where science is part of the social totality which includes an integration of values.

Chapter One of the thesis deals with the scientific and philosophical base from which Whitehead's analysis commences. Chapter Two is the organological theory itself and Chapter Three is assessment, criticism and discussion derived from the thesis.

Abbreviations

The following are the abbreviations of the titles and editions of Whitehead's books employed in the notes:

AE The Aims of Education, The Free Press, New York, 1957

AI Adventures of Ideas, New York: Macmillan 1933

CN The Concept of Nature, Cambridge: Cambridge University Press 1933

MT Modes of Thought, Cambridge: Cambridge University Press 1956

PNK An Enquiry Concerning the Principles of Natural Knowledge, Dover Publications, Inc., New York 1982

PR Process and Reality (1929), corrected edition edited by D.R.Griffin and D.W.Sherburne, New York: The Free Press 1978

PRel The Principle of Relativity, Cambridge University Press, 1922

The book "The Philosophy of Alfred North Whitehead" Edited by Paul Arthur Schilpp, The Library of Living Philosophers Vol. III, published by, La Salle, Illinois, Second Edition 1951, will be referred to in the text as (Schilpp 1951) with the appropriate page reference included.

The book "The Philosophy of Whitehead, by Wolf Mays, published by George Allen and Unwin Ltd. London 1959, will be referred to in the text as (Wolf Mays 1959) with the appropriate page reference included.

The book "Whitehead's Philosophy of Organism" by Dorothy Emmet, published by Macmillan, second edition 1966, will be referred to in the text as (Dorothy Emmet 1966) with the appropriate page reference included.

The book "A Key to Whitehead's Process and Reality" by Donald W Sherburne, published by macmillan Company, 1966, will be referred to in the text as (Donald Sherburne, 1966) with the appropriate page reference included

The book "Leibniz" Ed. By G. H. E. Parkinson, Published by J. M.Dent & Sons Ltd., Everyman's Library, 1973, will be referred to in the text as (Parkinson, 1973) with the appropriate page reference included.

The Reader should also note that the plural of the word **Nexus is Nexūs.**

Introduction

This thesis is concerned with Whitehead's philosophy of nature, in particular with his concept of organism and his claim that the only adequate cosmology is one based upon the philosophy of organism. John Losse recognises four different and distinct 'philosophies of science' one of which is epitomised by reference to Whitehead:

> "One view is that the philosophy of science is the formulation of world-views that are consistent with, and in some sense based on, important scientific theories. On this view it is the task of the philosopher of science to elaborate the broader implications of science. This may take the form of speculation about ontological categories to be used in speaking about 'being-as-such',"[1]

Chapter One is concerned with the general background of Whitehead's account of organism by introducing his ideas of philosophy, science, the philosophy of science. In particular it will deal with Whitehead's disaffection with some doctrines of the philosophy of nature which developed as a result of the 17th century scientific revolution, as well as his conviction that the reasons for their retention have long since passed. In his view they have in fact become an obstacle to new and innovative notions in the philosophy of science. He firmly believed that a philosophy of organism could do justice to the aspects of nature brought to light by modern science.

Whitehead alluded to two different meanings of the word organism which are related but are intellectually separable. The first relates to the macro-world and is concerned with certain characteristics of the natural world, where the process of creation is recognised as being channelled through many social groupings of societies. These societies are used for the interpretation of the stubborn facts of apparent reality:[2]

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1. John Losse, Historical Introduction to the Philosophy of Science, Oxford University Press, 1972, Third Edition 1995, Introduction p1.
As Losse notes, Whitehead did not use the word 'influence'. Changing 'influence' to 'becoming', would provide a better description of Whitehead's intentions for his philosophy. 2.PR p128.

"It is the description of the process of transition from attained actuality to the actuality that can be attained."[1] The second meaning relates to the microscopic and is concerned with: "...the formal constitution of an actual occasion, considered as a process of realising an individual unity of experience".[2] It is process of the conversion of what has the potential to be, into the thing that will determine the nature of actuality. Chapter Two of the thesis will be devoted almost entirely to the description and explanation of this microscopic aspect of organism.

Chapter Three will perform three tasks. The first will be to present objections and concerns of some of those who are not entirely convinced by the thesis, either in its methods, premises or conclusions the second, will be to make a positive and sympathetic affirmation of the thesis and its cosmology, and the third section will be a critical evaluation of all these aspects, focusing in particular on a the claim of the thesis, that the only adequate cosmology is one based upon the philosophy of organism.

Whitehead's long academic carrier is often divided into three parts, being the time he spent at the universities of Cambridge, London and Harvard. We will be concerned with his late period, 1924 - 1947 which was at Harvard and his works of 'Process and Reality', 'Science and the Modern World', Adventures of Ideas and 'Modes of Thought'. Clearly, through such a long period of research and teaching in mathematics, science and philosophy, notions and interpretations will change. We are indebted to many scholars, such as Lewis Ford of Norfolk, Virginia and before him Victor Lowe of Cambridge, England, for researching the details of the development of Whitehead's philosophy of organism. However, the development of the final text of the book 'Process and Reality' is a major subject which will be referred to only in so far as it is necessary to the understanding of the philosophy of organism.

1.PR p214, 2.PR p129,

Similarly Whitehead has made an important contribution to the vast subject of religion and theology, indeed his whole approach to his philosophy has been described as having a 'religious' base. That subject will not feature in this thesis as a major topic of research. However as Whitehead's philosophy of nature relies upon metaphysics, some reference to his theological views or 'Religion' will be necessary.

In this thesis I have attempted to be as objective and scholarly as possible, especially when dealing with topics which have provoked controversy. This does not mean that I do not have bias of feelings of my own on some of these issues. I trust that they will not be too readily discernible by any reader and that at all times the quest for objectivity will be recognised.

Chapter I SCIENCE, PHILOSOPHY OF SCIENCE AND METAPHYSICS

Introduction

The aim of the first Chapter is to introduce the topics which provide an understanding to Whitehead's interpretation of European philosophical thought, and his conviction that from such a study we are inextricably led to the conclusion that only a scheme of interpretation based upon a philosophy of organism is adequate.

The first section will be concerned with the development of scientific and philosophical doctrines, including the science and pre-science of the Greeks, and the scientific revolution of the 17th century. It will include an assessment of the attempts of modern science to equate the doctrines of the period to the advances in knowledge which challenge some of the previous underlying assumptions.

Section two will deal with two topics, first, Whitehead's description of the scientific method of induction as the basis of the Scientific Revolution of the 17th Century, and his response to the challenges this presented to the philosophy of science. Second, the parallel development in philosophy of Rene Descartes' philosophy of ontology, with its resulting doctrine of the duality of mind and matter.

The third section will consider Whitehead's 'apologia' defending and clarifying the role of metaphysics and speculative philosophy in the construction of his organological cosmology. The search for general principles will be recognised as the first goal in establishing the nature of a complete fact. The task of speculative philosophy will be demonstrated as that of formulating a scheme in which the abstractions of the different philosophies and their general principles can be melded into a comprehensive cosmology.

Section four will assess the development of science and philosophy in terms of their harmony and disunity, from the perspective of the philosophy of organism. The role of philosophy in its attempt to unify the different philosophies as abstractions into a combined general scheme, will be considered with the general scheme itself. This will entail the recognition of intuition as the basis of rationality, and rationality as the foundation of both science and philosophy

1 European Science from the Pre-Science of the Greeks to Modern Science.

Introduction

After considering the pre-science of the Greeks and the nature of the 17th Century Scientific Revolution we will assess Whitehead's criticism of the notion of 'simple location' and the development of the doctrine of scientific materialism. Developments in the new science, regarded by Whitehead as assisting in the validation of his challenge to assumptions underlying its interpretation, will be presented. This will be followed by some of Whitehead's observations concerning the importance of Einstein's theory of Relativity and the quantum theory.

Early Greek Science

According to Whitehead, if it is true that modern science was born in Europe we should regard Greece as the mother of European science, for it was there that the birth of many of our modern ideas took place. However, he makes a clear distinction between what he calls 'science' when referring to modern science, and the earlier investigations into the order of nature before the seventeenth century, which constitute for him a form of 'pre-science'. He expresses great admiration for the enterprises of the Greeks, for their learning and philosophical achievement. Many of these ideas - Ionian, Platonic and Aristotelian for instance - spread throughout the Mediterranean world and the rise of modern science would be inconceivable without them. Yet in spite of this, in Whitehead's analysis, they did not achieve what he refers to as the 'complete scientific mentality':

> "Their minds were infected by an eager generality. They demanded clear, bold ideas, and strict reasoning from them. All this was excellent; it was genius; it was ideal preparatory work. But it was not science as we understand it."[1]

The emergence of a state of mind which may be termed scientific stems from an instinctive belief in the order of nature. According to Whitehead, such a mind has overcome the apparent irrationality of newness within repetition and may be described

1. SMW p9,

as possessing the full scientific mentality.[1] He did not include Aristotle and Archimedes in this irrationality, for they were determined to investigate in detail the phenomena in which they were involved, derived from the general order of things. The distinction between them and their contemporaries was emphasised by describing them as being endowed with the 'full scientific mentality'.[2] To have such a mentality was to adopt the belief that everything encountered has a part to play in developing an understanding of the general principles which can be discovered in the natural order of things.

According to Whitehead's analysis, the Greek pre-scientific work failed to be truly scientific, as we understand that term today, for three main reasons. Firstly their enquiry progressed along mainly rationalistic and philosophical lines. We should distinguish between their investigations into a field of objects and the purely empirical approach of modern science. Their questioning of the working of nature led them to progress in natural mathematics and geometry, the support from which was predominantly logical and deductive and of a purely rational character, especially through their use of geometry. However, their attempts to formulate deductive theory, regarded as derived from natural phenomena through philosophical reasoning, involved the neglect of the study of observational detail. This was more than a failure to probe, it also included a failure to test, a procedure which is essential in any empirical science.[3] To sum up, the Greeks were too theoretical so that for them science was but an offshoot of philosophy.[4] However, in recognising the general nature of this analysis Whitehead pointed to important exceptions where the description does not apply:

> "Their ideas have been transmitted to us enriched by the genius of Plato and Aristotle. But with the exception of Aristotle, and it is a large exception, this school of thought had not attained to the complete scientific mentality."[5]

The second reason, connected with the first, was that they interpreted nature in terms of a drama: "Nature was a drama in which each thing played its part."[6] By interpreting nature in this way their thoughts were turned in the direction of the end rather than the origin of things and the idea of a completion of things rather than the equally important beginning of things, which could be equally significant in

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1. SMW p4, 2. SMW p6, 3. SMW p8, 4. SMW p19, 5. SMW p8 6. SMW p10,

understanding problems of nature. Just as they looked toward the end of the play for an answer in a moral sense, so also in science they imposed their preconceived ideas on their work, so that a remorseless 'inevitableness' dominated their view of science and the laws of the scientific world became synonymous with fate. Whitehead is not clear as to whether Aristotle himself would have approved of this view, but it is the view which subsequent Greek thought extracted from Aristotle.[1]

Whitehead perceived the continuation of this influence into the Middle Ages. The effect was to quench the Historical Spirit and focus attention upon efficient causes rather than the final causes sought by the Rationalists. This was expressed equally in the scientific movement as much as in the religion of the reformation. For example, Whitehead interprets the conflict between Galileo and the Church not in terms of an appeal to reason by one party and its rejection by the other, but as a complete misunderstanding of one asking 'why' and the other 'how'? Thus, according to Whitehead, we should not conceive the Historical Revolt as based upon anti-intellectualism: "It was a return to the contemplation of brute facts."[2] It was Whitehead's belief the results of this pseudo conflict in the Middle Ages between reason and brute fact have been far reaching and extreme. It was the reaction from this conflict which gave birth to the modern scientific movement and through which it inherited the anti-intellectualism of the Historical revolt. "Accordingly, although one outcome of this reaction was the birth of modern science, yet we must remember that science thereby inherited the bias of thought to which it owes its origin."[3]

Whitehead drew a parallel between modern science and the fate in Greek tragedy by comparing the faith of modern science in the order of nature as demonstrated in the observation of the famous eclipse of the planet Mercury in which the image of its position appeared out of place as a result of the sun acting as a gravitational lens, with a Greek drama. According to Whitehead such a faith has now developed

1.SMW p10, 2. PR p10, 3.SMW p12.

into what pervades scientific thought today which is a remorseless inevitableness.[1] But even with the disappearance of the direct effect of Greek Tragedy, the moral dimension remained in the form of: "...a definite articulated system which defines the legality of the detailed structure of social organism, and of the detailed way in which it should function."[2] However, a general sense of the order of things alone, is insufficient for science. It has a method of 'exact thought' which Whitehead interprets as the result of the long history of scholasticism retained by science long after the scholastic movement had ceased. Thus, Galileo took from more from Aristotle than at first might have been suspected, recognised in his 'clear head' and 'analytic mind'.[3]

However, of greatest significance is that the scientific movement gained from the Greek and Medieval world the fundamental belief that any and all detailed occurrences can be correlated with their antecedents in a definite way, which is able to exemplify general principles. This is the basis of the motivating power of research. It is part of the conviction of people of science that an answer can be found to any mystery.[4] This means the recognition that every event or occurrence which can be associated with the present is somehow associated and connected with specific antecedents of the past in an orderly manner, which itself suggests operation under a general principle.[5] It is this, with its active interest in the simple occurrences of life, which has kept science in touch with the concern of people in their daily life, through technological development.[6] It was also this instinctive conviction that gave hope and meaning to efforts of scientists and providing the necessary impetus to their enquiring minds.

The third reason why the pre-scientific work of the Greeks failed to be truly scientific, according to Whitehead, is one common to all attempts to appeal to facts through language. Whitehead recognised this as a difficult operation. The

1.SMW p13. 2.SMW p14, 3.SMW p15, 4.SMW p15, 5.SMW p15, 6.SMW p19.

adequacy of the words to express particular facts in sentences is what is at issue. The aim of Whitehead's philosophy is to discover the generalities which lie behind our investigations into nature but it is exactly at this point that he believes the language of literature breaks down.[1] Excessive trust in linguistic phrases is a well known reason for debasing Greek philosophy and Physics. Whitehead points to Mill's writing for exemplification, quoting his criticism of their inability to classify objects in nature other than those which appeared natural from usage of their own language. Mill's conclusion that 'Greek schools of speculation' dealt with little more than a sifting and analysing of notions current in their every-day language, concur with those of many others.[2] However, Whitehead recognised that this problem is general and should not be directed particularly at the Greeks:
"Language is thoroughly indeterminate, by reason of the fact that every occurrence presupposes some systematic type of environment."[3]

The beginnings of Modern Science

Whitehead had attempted to demonstrate that it was from these 'antecedent conditions' which have been described, that the way was prepared for the scientific revolution of the 17th Century. The 'historical revolt' of the 16th Century was in essence the rejection of the view that:

> "...the avenue to truth was predominantly through a metaphysical analysis of the nature of things, which would thereby determine how things acted and functioned. The historical revolt was the definite abandonment of this method in favour of the study of the empirical facts of antecedents and consequences."

In science this led to reliance upon experiment and the inductive method of reasoning[4]

Whitehead also claimed that, as a result of the advancement of science through the work of many geniuses of physics, there was a general faith in the ability of Physics to explain the existence of living organisms based upon particular configurations of matter, with its own movement in space described by physical laws.[5]

1.PR p11, 2.PR p12, 3.PR p12, 4.SMW p49, 5.SMW p52.

He recognised Bacon as one of the earliest of those geniuses who was aware of the full extent of the intellectual revolution which was taking place as a result of the changes in science. It was Bacon who taught the need to pursue the experimental method, which, with attention to the irreducible stubborn facts, was the inductive method by which general laws could be elicited. In this he was outside the dominant interpretation of the revolution, with its understanding that passive matter operated on by external forces, were enough to interpret the events of nature.[1] Bacon advanced an experimental method, based on observation, number and frequency of occasion, which formed the basis of the new inductive method of science, as a means of discovering what he called axioms of nature. He was convinced that if sufficient care was given to the collection of instances with his rules of inductive generalisation, the laws would reveal themselves.[2] Whitehead regarded this method not only as the distinguishing feature of the new science, but also the basis for all our scientific procedures:

> "Without the shadow of a doubt, all science bases itself upon this procedure. It the first rule of scientific method, - Enunciate observed correlations of observed fact. This is the great Baconian doctrine, namely, Observe and observe, until finally you detect a regularity of sequence."[3]

However, Whitehead also recognised in the work of Bacon, an example of those who rejected the almost total reliance on the rationalism of the scholastics, in favour of the adoption of what was in effect the other extreme of the new faith, which was in induction. In this doctrine knowledge in the present becomes something which develops out of the regularities of the past, and which will continue to apply reliably in the future.[4] The reaction against rationalism in the 17th Century is recorded by Hooker in his 'Ecclesiastical Polity'. Whitehead believed that although some reaction to the dependence of Greek pre-science on rationalism was in order, the ferocity of the reaction was not only excessive but it has continued with a vengeance through to the birth of modern science and it is this over-reaction which has been destructive.[5]

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1 SMW p53, 2.SMW p54, 3.AI p116, 4. SMW p55, 5.PR p12.

Whitehead also recognised that by the end of the 17th Century, science had been founded satisfactorily on the basis of measurement, the final formulations of derivative laws being provided by Newton. The common measurable element of all bodies was mass. Descriptions could be based on the recognition that all bodies of the same substance, shape and size, had approximately the same mass. Newton was able to calculate the force acting on a body at a distance quantitatively.[1] The world could now be described in terms of the great forces of nature such as gravity. These forces were themselves determined by a succession of instantaneous configurations of matter, which controlled their own changes. This completed a whole cycle of scientific thought which appeared to require no further elucidation. Such a complete system leaves little wander that the science of the day was confident that it had described the fundamental elements of nature. This is the famous 'mechanistic' theory of nature sometimes referred to by Whitehead as the theory of 'materialistic mechanism'.[2]

Whitehead believed that the concept of 'mechanism' itself requires a re-interpretation. The earlier understanding of the concept offers no explanation for time, space, matter, material, electricity, structure, pattern, function or organism.[3] The doctrine of materialistic mechanism introduces the philosophical difficulties of determinism in which molecules run blindly in accordance with general laws. According to Whitehead the fundamental entities which endure are organisms.[4] The theory of Organological mechanism Whitehead is proposing avoids the difficulty of determinism. Although the molecules may still appear to run blindly, what is now recognised, which materialistic mechanism did not recognise, is that

1.SMW p57.
2. SMW p63. The notion of 'materialistic mechanism' is an extreme development from the doctrine of scientific materialism. It is a philosophical doctrine of determinism in which the molecules of a body are regarded as devoid of volition and which run as programmed regardless of changes in context or environment. It results from the notion of vacuous material enduring passively through various accidental adventures, having no volition of its own.
3.SMW p21, 4.SMW p98.

an organism operates in such a way that the over-all plan of the organism influences the characteristics of any subordinate organism which it contains.

Considering the example of the animal body, it is clear that the mental states of the total organism must be included for the mental state is regarded as a part of the general plan of the body. Such a relationship will have an influence on the plans of other organisms which are contained within the primary organism, in a descending scale down to the smallest organism, which could be an electron.[1] The result is that we should expect an electron in the body to behave differently from one outside the body. This argument utilises a general principle which applies throughout nature, not being confined simply to animals or living bodies. This organological theory provides greater scope for taking into account what Whitehead describes as: "...the concrete affairs of life," which includes the moral constitution of humans. This is an ability totally lacking in the materialistic doctrine.[2] Whitehead protested that the description of the locations of the configurations of matter over a period of time did not contain reference to any other times, past or future. Such an omission implied to him that nature could be described as a series of discrete but unrelated occasions which have no connection with nature at any other period. As a result, induction could not be regarded as being based upon anything whose inherent quality has any connection with continuity. What does become clear, according to Whitehead, is that a series of associated doctrines have led to the establishment of a fixed scientific cosmology.[3] One of those doctrines is that of 'simple location'.

Simple Location

The first things to consider are the meaning of the notion of simple location and the reasons for Whitehead's antagonism towards it. This doctrine is based on the

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1SMW p98,
2SMW p99. Whitehead's application of the word 'concrete' will be dealt with in Chapter II Section 5 under the heading of the 'actual entity'.
3.SMW p64.

assumption that nature is composed of matter or material, the characteristic of which is to be situated in space and time, having external relations with the environment, but otherwise it is inactive. As a result matter came to be understood as anything which has simple location. According to this doctrine its relations refer equally to both space and time.[1] According to Whitehead' the ability to describe some particular material as 'here' or 'there' in a definite sense, which requires no further explanation as to other places in time or space or space-time, is an example of the operation of the concept of simple location. It applies when a region of space-time is considered to be a description of indicating a certain set of relations which some entities have to other entities. Position can be established without any reference being made to any other region, which may be considered analogously, though it may contain the same entities.[2]

Thus, the notion of simple location is inherent in the supposed most concrete aspect of nature, referred to as matter, material or stuff. Whitehead criticises this notion on at least three grounds. Firstly, that what is overlooked is that material is not affected by the division of time in the way that it is affected by the division of space.[3] The consequence of this is that there is nothing in the lapse of time that concerns the essence of the material. On this doctrine the passage of time is irrelevant.[4] This is in spite of the fact that it is possible to apply to both space and time the description 'here', a fact which can only be accounted for if they have something in common which requires no other qualification for its understanding.[5] Once a particular place in space-time has been specified then the relations between bodies in the same location can also be established.

Whitehead considers that there is one very significant difference between space and time. While temporal division does not divide the material, spatial division does reduce the volume of material. i.e. halving the space halves the volume. Thus, material functions quite differently in respect of time from the way it does with respect to the divisions of

1.SMW p61/62 2.SMW p62 & 72. 3. SMW p62, 4. SMW p63, 5.SMW p62.

space. Our notions of density at a point in space arise from the notion of the distribution of material throughout a definite volume. To speak of density is in fact to fail to 'assimilate' time with space.[1] According to Whitehead, the assumption that time has no effect upon the material, leads to the conclusion that time is irrelevant or an incidental accident, rather than something directly involved in the essence of the material. Such a notion frees the material from all effects of the passage of time for through a duration or instant of time, material is regarded as remaining the same.[2]

In this protest Whitehead is at one with Henri Bergson who had already objected to the notion of Simple Location and the suggestion that nature is made up of these solid bits of matter in space, whose relations to time and space are the same. Such a doctrine is a 'distortion' of nature due to the 'spatialisation' of things. On this they both agreed. However, contrary to Bergson, Whitehead held that this spatialisation is not necessary to the intellectual apprehension of nature. Spatialisation is simply the expression of more concrete facts under the guise of very abstract logical constructions. In the notion of simple location there is nothing in the present occasion which refers in any way to time, be it past or future.[3] This error of making the simple location of instantaneous material configurations a fundamental concrete fact of nature, is a particular case of what Whitehead calls the 'Fallacy of Misplaced Concreteness'. It is simply a case of mistaking the abstract for the concrete. It is the most fundamental error to be challenged by the philosophy of organism.[4] It is epitomised in the error of Simple Location in that the abstract is made into the concrete, in its suggestion that the object or matter is the real thing.[5]

A second of Whitehead's major criticisms is that a faith in the principle of Simple Location denies the believer any right to trust Induction. This is because the concept of the location of a particular bit of matter, in any particular moment, does not necessitate any reference to any other period of time, past or future. If no link with the rest of nature is required the implication is that nature at any one period does not require nature at any

1.SMW p63. 2.SMW p63, 3. SMW p64, 4. SMW p72.

other. Such a notion has serious implications for induction because induction relies upon the continued order of nature. The removal of thos connection would destroy any reason to look to nature for the trust we place in laws derived from the observation of nature: "In other words, the order of nature cannot be justified by the mere observation of nature."[1] On this basis there could be no justification for laws such as those discovered by Newton on Gravity, which clearly have been formulated on the basis of the continuity of Nature.[2]

A third criticism of Whitehead is also in respect of the continuity of nature, for the notion of simple location becomes a challenge to memory. Inductive reasoning assumes that the mind is aware of the sate of nature before the current configuration occurred. To continue to give assent to the doctrine of simple location is to imply no confidence in induction because whatever is in question in the present has only the past for comparison. Induction is then not based upon anything which is inherently associated with the observation of nature.[3]

Whitehead's concern is that the application of the notion of simple location encourages particular assumptions concerning the nature of matter, which it regards as the ultimate brute fact of nature which is spread throughout space in a flux of configurations, in the dominant scientific cosmology makes. Matter is inert and does nothing other than follow a fixed routine dictated by its external

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5.SMW 72. Evander Bradley McGilvary takes issue with Whitehead's arguments against simple location. He agrees that Whitehead has made it clear that he means to reject the idea of 'bits of matter' as the relata in the relational theory of space, in favour of the substitution of 'actual occasions'. He also agrees that it was right for Whitehead to attempt to produce a total systematic philosophy, which includes such questions as 'perspective', 'simple location' and 'prehension' - the latter being the ability to take up characteristics from another - but he finds difficulty in distinguishing between Whitehead's description of the fallacy of simple location and the relativist doctrine of space. He challenges Whitehead's use of a notion such as 'perspective' in the presentation of his thesis, by quoting Whitehead's own words when he stated that in a certain sense, everything is everywhere at all times. On this basis everything must have a location. SMW 128/129 (Schilpp 1951, pp209-239)
This criticism is discussed more fully in Chapter III, Section 3.
1.SMW p64, 2.SMW p64, 3.SMW p64/5,

relations, Whitehead describes matter in this assumption as senseless, valueless and worthless. The assumption he labels 'scientific materialism'.[1]

R Palter believes that Whitehead's challenge to the notion of simple location of material objects was not simply based upon the incoherence of materialism, as might appear from some references in Science and the Modern World, but rather from Process and Reality, where the challenge is directed more against Hume's doctrine of; "...the independence of successive perceptions."[2] Palter repeats what is inherent in Whitehead's praise of the Newtonian physics as having been successful for three hundred years in assisting the development of science, when he states that the concept of simple location was also part of that successful theory of matter. As a philosopher of science, Whitehead knew he had to take account of the remarkable success of classical physics.[3]

Wolf Mays suggests that the continuity of nature does not depend upon simple location but there is a justification for laws such as those formulated by Newton without such a notion . To Whitehead's description of an object as 'here' or 'there', in his discussion on simple location,[4] Mays describes Whitehead's alternative view of a 'perspective' as a relationship of events each of which induces a modification in other events. These events are regarded by Whitehead as 'force fields' which have a focal centre from which comes a stream of influence: "The radiating field is the correlated system of aspects of that event as it modifies the other events in nature. Each event of focal centre is therefore a comparison of the overlapping aspects (or fields) of all the other events in the universe, while its aspects in other events are the set of modifications set up by it."[5]

1.SMW pp22 & 55, 2.PR p ,
3. R Palter, Whitehead and the Philosophy of Science, International Studies in Philosophy, Spring 1980, Vol. 12, p82.
4. (SMW p87, PR 132)
5. (Wolf Mays, 1959, p134\5) For further comment on the relationship between 'events' and 'actual entities' see Section 5.

Scientific materialism

According to Whitehead the importance of the doctrine of scientific materialism is in the establishment of a scientific cosmology. The doctrine has had an inhibiting influence on the establishment of cosmologies based upon pluralistic realism. The doctrine of materialism developed in the 17th and 18th centuries and persisted throughout the period of the 18th and 19th centuries. It is the belief that what is real in nature is matter, and this exists in time and space and it suffers from inertia.[1] The doctrine persisted throughout the period up to and into the 20th Century. Scientific materialism presupposes that the ultimate entity which underlies everything is irreducible brute matter or material, which is distributed throughout space in a variety of configurations and within itself is without value and purpose. All its activity is deemed to be controlled by external forces: :

> "It can be summarised as the belief that nature is an aggregate of material and that this material exists in some sense at each successive member of a one-dimensional series of extensionless instants of time. Furthermore the mutual relations of the material entities at each instant formed these entities into a spatial configuration in an unbounded space."[2]

A consequence of this theory is that space becomes as instantaneous as the one dimensional instants of time in which matter is regarded as existing. Such a doctrine demands an explanation of the nature of the implied successive instantaneous spaces. According to Whitehead it is part of the weakness of the theory that it is unable to offer any answer to its own question, as to how this can take place.[3] Whitehead accounts for its dominance as a result of its formulation at the early stages of scientific thinking.[4] It has survived as a fixed scientific cosmology which presupposes the ultimate fact of an: "... irreducible brute matter, or material which is spread throughout space in a flux of configurations". Such a material is senseless, valueless and purposeless. It has no other role than that of simply being there, and following a fixed routine which is imposed by its external relations. Even these relations do not spring from the nature of its being.[5]

According to Whitehead what science has been left with in this doctrine of matter and space, is a metaphysical scheme without evidence to support it. It is a doctrine of

1.CN p43, 2.CN p70/71. 3.CN p71, 4.SMW p242/3, 5. SMW p22.

'undifferentiated endurance' in which a sense object such as a stone is an extensive plenum, recognised by an attribute such as colour i.e. a stone is an undifferentiated endurance of material. This is in spite of the fact that we know that the stone is a multiple of differentiated characteristics. Any discontinuity of the stone as an object is explained in terms of modifications of these accidental qualities.[1] Such an interpretation of the basic nature of a stone permeates ordinary language, philosophy and science. This is the metaphysical concept which is at the heart of scientific materialism. However, according to the philosophy of organism, the whole concept on which this analysis of the stone is based is entirely mistaken. The colour is now recognised as being entirely separate from the stone. The molecular theory has removed the unity, continuity and passivity of the stone, by demonstrating its nature as a society of separate molecules in violent agitation. Unfortunately, the discovery of these facts did not resolve the problem of the stone, for the materialistic interpretation applied to it was transferred to molecules. The atom was attributed with being the 'stuff' of the stone which retained its self identity through any time span: "Thus the notion of the undifferentiated endurance of substances with essential attributes still applied."[2] According to Whitehead, the root doctrine of materialism has remained, and substance is still conceived as the ultimate entity, the same fundamental error with the stone being repeated with the atom and molecules.[3]

Whitehead welcomed the new discoveries made concerning the atom and their explanation in terms of the quantum theory. Atoms were being associated with each other by a law through the periodic rhythms of molecules, while the energy loss in the 'burning' of stars was explained by the vibratory theory associated with quanta.[4] Whitehead was encouraged by the fact that the rhythmic periods cannot be separated from the entities

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1.PR p77. 2.PR p78,

3. Wolf Mays considers that the inclusion of relativity also plays an important part in Whitehead's challenge to materialism and his endeavour to convince philosophers and scientists that the world is not made up of objects or substances, independent of each other and characterised by qualities, is part of that endeavour. Mays believes that the structure of Whitehead's system is best described in terms of 'multi-termed relationships' rather than by subjects and predicates. (Wolf Mays, 1959 p223)

The only valid way to explain the atom, according to Whitehead, is in terms of a society which has rhythms of definite periods.

known as protons and electrons. All this new information collectively, was challenging the notion of enduring substance, with its continuing qualities. Whitehead recognised that as a notion todescribe perceptual immediacy, materialism had its advantages, though it is only expressing what is a useful abstraction for the purposes of daily life. As a fundamental statement as to the nature of things it proves to be mistaken.[1]

Whitehead advocated the separate consideration of time and space in this doctrine as he did in the earlier example of simple location. In such a materialistic philosophy of nature, where nature has been conceived as an aggregate of material which exist, in some sense at each successive moment of a one dimensional series of extensionless instants of time, the material relations at each instant could be described as forming a spatial configuration in an unbounded space. But the materialistic doctrine refers only to a persistent space and does not isolate the notion of a succession of instantaneous spaces. It is from such a purely intellectual description of experience, presented in this abstract form, that Whitehead believes these weaknesses, which are not at all obvious from the presentation of the 'natural theory' of materialism, are brought out.[2] He emphasises that his purpose is exactly this, to demonstrate these characteristics of the theory in terms of experience.[3]

According to Whitehead, the doctrine has been lifted out of its original context and used as a universal scheme for understanding nature. Had it been strictly confined to those aspects of research for which it was originally devised it would have remained useful and been no problem. But it is now being applied to areas of investigation for which it is entirely unsuited. This suggested to Whitehead that science had reached a turning point. The basic premises of physics were no longer proving adequate to deal with the new knowledge it was encountering and a re-evaluation was necessary. The old certainties were becoming uncertain. Whitehead listed the new areas of doubt as: "... time, space, matter, material, ether, electricity, mechanism, organism, configuration, structure, pattern, function,"[4] He emphasised the importance of knowing the meaning of these words if we are to use them to describe anything.

1.PR p79, 2.CN p71, 3. CN p72, 4.SMW p21.

Another unfortunate development, according to Whitehead, was the employment of the doctrine of materialism as the basis for the construction of a cosmological theory in which the matter experienced change as a result of accidental qualities and relations, yet it remained one self-identical bit of matter.[1] This doctrine was used to provide a description of the physical universe in terms of physical causation. Its chief inadequacy was in its lack of provision for a connection between the mechanistic description of nature and a reason for the existence of the individual perceiving it, i.e. it offered no final cause or end. It leaves this unwelcome dichotomy to be dealt with by each individual insisting that physical causation is supreme. Whitehead refers to this as a 'radical inconsistency'. It is thereby advocating an absolute faith in the ability of the higher animals such as humans, which are regarded as a 'self-determining' animals, to explain that mechanistic method of operation.[2] The only way of mitigating the problem is to recognise the error of attributing everything to a materialistic mechanism which in reality is not a mechanism.[3] Taking the step of rejecting the theory would point us in the direction of discovering a solution to other questions such as the mind / body problem.[4]

Although, according to Whitehead, the doctrine was possibly the 'greatest single success which mankind has ever achieved' the irony was that this very success of physics inhibited the development of the biological sciences. The concepts of physics are unsuited to biology and the language of physics is hardly suited to the expression of the biological sciences, thus, the success of physics inhibited the impact of biological notions of the 17t^{h} Century.[5] The materialistic concepts shaped at this time became so dominant, being applied so totally to all questions relating to physical aspects of nature, that it became extremely difficult to recognise the possibility of there being some other way of approaching the challenges encountered in the study of nature.[6]

However, the greatest contribution of the scientific revolution, for which the whole of the

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1.PR p78. Whitehead's notion of 'realism' is considered in Section 4 and that of 'pluralism' in Section 9.
2.SMW p94, 3. SMW p95, 4. SMW p96, 5.SMW p51. 6.SMW 53

scientific movement is indebted, was the new belief that general principles could be established from the study of the details of occurrences in relation to their antecedents.[1] According to the philosophy of organism, all we should expect from the present occasion, is that it permits us to establish the nature of the present situation from the particular community of occasions from which it is constituted i.e. from its environment. The authority for this is simply the inclusion of those occasions into a single unity. A 'fillip' to the organological philosophy is derived from the basis of inductive reasoning which is concerned with relations between occasions and communities within a particular community of occasions.[2] It is in this context that Whitehead draws attention to Newton's three laws of motion and his law of gravitation. Galileo was the one to recognise that the central question related to the change in motion of bodies rather than simply their movement, as later formulated by Newton in his first law.[3] According to Whitehead, it is this law which deals with a concept essential in scientific theory. The concept is that of an ideally isolated system.[4] By this Whitehead means that the system is isolated within the universe so that truths involved within that system require no other reference to the remaining universe to substantiate them, other than that they are a part of the totality of things. There are truths within the system which are justifiable from within that system and require no reference to issues outside that unit of occasions. Whitehead makes it clear that this is not a solipsistic concept for it still recognises that parts of the universe do have relationships one with another. The idea of the separation of an isolated system is that of a unit within the context of a larger unit.[5]

This concept plays an important role in Whitehead's theory of cosmic law and the epochal theory: "Thus the conception of an isolated system is not the conception of substantial

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1.SMW p15, 2.SMW p56,

3 Ivor Leclerc expressed sympathy for Whitehead's endeavour to formulate a conception of the ultimate facts of physical science. He agreed with Whitehead's claim that philosophy and science had been overlooking the very important aspects of Newtonian physics such as the 'state of change' and 'acceleration', to which Whitehead had drawn attention. Based on his own interpretation of SMW p61f and AI p200\201 he says: "The point is that velocity, acceleration, etc., all involve the notion of a state of change, but this is precisely what has evaporated from the ultimate Newtonian facts."
Ivor Leclerk, Whitehead's Metaphysics - An Introductory Exposition, George Allen & Unwin Ltd. 1958, p7. 4.SMW p58, 5.SMW p58.

independence from the remainder of things, but of freedom from causal contingent dependence upon detailed items within the rest of the universe."[1] The significant phrase 'causal contingent dependence' may be understood to mean free from the generally accepted idea of things as being dependent upon each other for their nature and existence, without which they would not be what they are. Whitehead explains that causal dependence is a description only for 'certain abstract characteristics' which belong to the isolated system and do not belong to the totality of the system as it exists in its concrete nature, i.e. in the case of a force acting on a body the force does not interfere with the nature of the body as a unit, only upon its movement.[2]

In the philosophy of organism the notion of an ideally isolated system is associated with the concept of society. It is society which provides the order and stability required for the development of entities to the fullness of their potential. No society is itself in isolation, for each one has a wider background of societies which influence the nature and conditions within the individual societies. The contribution of such a wider society is the provision of continuity and stable conditions conducive to the continuation of the societies within the group. Every society requires a sound background of which any given society is itself a part.[3] This doctrine is based upon the principle which states that fundamental ideas can only be understood in terms of the entire order of nature and that nothing can be understood in total isolation.[4] Hence an ideally isolated system in the context of the philosophy of organism, represents a form of society.[5]

The success of the new materialism was observed mainly in dynamics, physics and chemistry, the development of the latter being the result of scientists such as Lavoisier. Whitehead regarded this development as the last of those great strides which could take place on the basis of a materialistic philosophy, within the framework of its own special abstraction, without introducing for itself serious

1.SMW p58/9, 2. SMW p59, 3. PR p90. 4.PR p3.
5. Whitehead's description of society is dealt with more fully in Section 7.

problems to challenge its own premises.[1]

Whitehead's attempt to re-evaluate the ultimate facts of physical science did not meet with universal approval, even though, in the case of scientific materialism, most now share Whitehead's disaffection with that doctrine. Wolf Mays notes the danger when interpreting Whitehead's philosophy, of failing to recognise that Whitehead uses the same language in his epistemology to describe both physical phenomena and psychological experiences. Mays believes that such an attempt to form a parallelism between the two is not justified. But he recognises that this could be disputed on the grounds that, rather than attempting to re-evaluate some of the basic notions in modern physical science, which is the usual belief, Whitehead was continuing the task of his earlier works of criticising concepts of the Newtonian Classical Scheme, such as simple location and the fallacy of misplaced concreteness. That criticism was from the standpoint of modern physical science. This interpretation is more conducive to Whitehead's practice in Process and Reality of using illustrations from modern physics in support of his philosophy. If the interpretation that Whitehead was re-evaluating the notions of modern science is correct, then we must question whether Whitehead would be using modern science as a basis for his own criticisms? In effect his use of modern science demonstrates a confidence in it.[2] Furthermore, Whitehead's argument against the Newtonian classical scheme is today largely accepted by modern science, in so far as the 'billiard ball' concept of objects has been replaced by the field theory.[3]

Ivor Leclerc believes that without some understanding of the doctrines Whitehead was rejecting, we will not truly appreciate Whitehead's own organological scheme. He rejected a specific ontology which he interpreted as a metaphysics of nature, inherited from the 17th Century Scientific Revolution. It had introduced: "...a radically new metaphysical concept of nature i.e. the notion of the physical as matter. Matter was

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1.SMW p75. 2.(Wolf Mays 1959 p204) 3.(Wolf Mays 1959 p205)
According to Mays, Whitehead directly substitutes the term 'energy' for the notion of a 'quantitative emotional energy' and the term 'form of energy' for the notion of a 'specific form of feeling' in PR 116. (Wolf Mays 1959 p211)

regarded as the fundamental thing that 'is'. This was not a new ontology but that of the Neoplatonists which had experienced a revival in the two centuries immediately prior to that Revolution.[1] Such an ontology Leclerc believes is clearly apparent in Descartes' conclusion that there are two kinds of being, soul which has cognition and matter which has extension. This conclusion was the direct result of the Neoplatonic ontology which stated that what 'is' must be a complete unity not composite and thus changeless in itself. Change involves some kind of becoming and this can only apply to composites. The Neoplatonists had as a premise the doctrine that whatever the fundamental being or thing is, must be outside the notion of becoming. Thus, the nature of the physical as a composite of matter and soul, could find its completion in becoming. It was in this respect that the new doctrine of the 17th century revolution deviates from the earlier doctrines of the Neoplatonists, in regarding matter as incomposite and therefore changeless.[2]
It is to this question of Whitehead's use of modern science that we now turn.

Contemporary Science and the challenge it poses.

Some aspects of 19th and 20th Century science posed a challenge to the accepted doctrines and assumptions resulting from the 17th century scientific revolution. New discoveries had led to new theories, producing a need to link scientific discovery to doctrine.[3] Whitehead selected four examples of such novel ideas, developed from advances in knowledge, to illustrate the challenge.[4] The first two he describes as antithetical, in so far as they do not appear to be harmonious. The first of these is the notion of the physical field. Development of the theory resulted from discoveries concerning the undulatory theory of light and electromagnetism. The concept of mass had to give way to new descriptions of physical nature in terms of energy, where mass became understood in relation to a quantity of energy. This led to the notion of energy as fundamental.[5] The climax of Maxwell's work was the conclusion that there are electro-magnetic occurrences throughout all space,[6] the

1. Ivor Leclerc, Process and Order in Nature, In: 1983, p119.
2. Ivor Leclerc, Process and Order in Nature, In: 1983, p120.
3.SMW p121, 4.SMW p122, 5.SMW p122, 6.SMW p123.

acceptance of which led to the introduction of some physical sciences based upon the notion of continuity. This has implications for the philosophy of organism in its concept of nature as process.[1] The second notion, apparently antithetical to the physical field theory, was that of John Dalton's atomic theory, which conceived ordinary matter to be atomic. In the philosophy of organism: "... the ultimate metaphysical truth is atomism"[2] However, A. H. Johnson emphasises the need to remember that in his philosophy Whitehead rejected the mutual exclusiveness associated with the traditional atomic theory, replacing it with the concept of 'distinguishable individuals'.[3]

Whitehead described the atom as 'creature'. He rejected the suggestion that the atomic theory of the philosophy of organism is in conflict in any way with the physical field theory, which we associate with continuity. Referring to the demonstration by Zeno in his 'Paradoxes', that continuity and becoming are not necessarily connected, Whitehead suggested that the apparent conflict between the two results from the misconception that there is a mutual exclusiveness between them. But the becoming of the atomic base in the philosophy of organism does not represent a unique seriality. They become and their becoming represents the continuity of the extended world. Thus, it is extensiveness which becomes. There can be a becoming of continuity, in so far as a particular epoch demonstrates the characteristic of becoming, but nature does not appear to demonstrate a continuity of becoming. The continuity we observe may be a special condition or characteristic, revealed in the creatures and their societies of this present epoch.[4]

Keeping a balance between the notions of 'atomicity' and 'continuity' is important, not only for the philosophy of organism but for all of physical science.[5] The question as to the nature of light presented a challenge which was only resolved by the

1.SMW p124, 2.PR p53,
3.A.H.Johnson, Whitehead's Theory of Reality, Dover Publications, Inc.NY, 1962.
4.PR p35, 5.PR p36.

combination in a new theory of Newton's corpuscular theory of light and Huyghens description of light, as the result of: "... the transverse waves of vibration of a subtle ether."[1] In order to arrive at this combination, physics was greatly assisted by mathematics, through the application of the abstract notion of periodicity. This was applicable to a wide variety of concrete examples. Thus a solution was found to what at first appeared to be two entirely different and contradictory descriptions of the nature of light, eventually harmonised through mathematics.[2] However, the implications of this for atomicity were not limited to chemistry. Whitehead widened the application to biology, in proposing that: "The living cell is to biology what the electron and proton are to physics."[3]

The cell theory was introduced into biology independently of its introduction by Dalton into physics. Thus, there was a sense in which it was regarded as quite independent of the new understanding of the nature of the atom. Whitehead believed that by the 1840's both doctrines were established as exemplifying part of the same concept of atomicity. Both of them involved explanations at infinitesimally small magnitudes, though Whitehead regarded the cell theory of Pasteur as more revolutionary than that of Dalton, for it was the first introduction of the notion of organism into the world of animate beings.[4] Further, on the scale of things, just as astronomy was revealing the enormity of things, biologists and chemists were revealing how infinitesimally small things are. Whitehead links the development of the cell theory for the philosophy of organism with the role of protons, electrons and molecules, in his own description of the nature of societies. He provides a list of societies and sub-societies which demonstrates the breadth of types of society as conceived in the philosophy of organism.[5]

The second two doctrines, with their associated discoveries which Whitehead regarded as of importance, are the conservation of energy and the theory of evolution. An significant aspect of both of these, according to Whitehead, is that

1.SMW p40. 2.SMW p41, 3.SMW 125, 4.SMW p125, 5.PR p98.

they are associated with transition and change, concepts at the heart of the philosophy of organism. Whitehead describes the adoption of these new doctrines as a serious blow against learned dogmatism which is unaware of the facts.[1] With these two, scientific theory had entered the realm of the technological revolution and had started a transformation of both the spiritual and material bases of social life.[2] James Joule described the transformation of energy as: "...the transformation of mechanical energy into heat and vice versa."[3] The theory of the conservation of energy provided a new concept of quantity and permanence which challenged the notion that mass, as described in scientific materialism, was the only and essential way of representing permanence and quantity in the underlying changes that were in progress. This eventually led to the subordination of the notion of mass as a kind of energy.[4] In so far as the term 'energy' may be used to describe a 'structure of happenings' it is also describing the nature of an organism.[5] Thus, a similar result, in the relegation of matter to a subordinate position in relation to energy, ensued from the development of the electromagnetic field theories as had occurred with the new understanding of the atom.

The fourth area, that of the doctrine of evolution, was a theory constructed to explain the disappearance of established species of life forms and the appearance of new ones, and was thus associated mainly with the biological sciences.[6] The theory presents a difficulty for scientific materialism because the concept of the basic 'material' from which the doctrine is developed, does not itself evolve. Whitehead describes this as an inconsistency between materialism and the theory.[7] Material is the ultimate substance. He questions whether the materialistic description of evolution is worthy of the title, for it simply relates to arbitrary and

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1.SMW p126. 2.SMW p127,
3.Alexander Hellemans and Bryan Bunch, The Timetables of Science, Simon and Schuster, 1988, p317, 4. SMW p127,
5.SMW p128. (Whitehead's answer to the question as to whether an organism can be described without reference to the notion of simple location of matter is considered in Chapter II, Section Five.) 6.SMW p126, 7.SMW p134.

purposeless changes in the external relations of 'bits' of matter. This hardly does justice to the modern understanding of the term which has to account for, first, complex organisms being derived from more simple antecedent organisms; second, a description of the underlying activity, and third, why this underlying activity reveals itself in the form of 'individual embodiments' which evolve as discrete organisms. In the philosophy of organism the notion of evolution, includes a real fusion of emerging values as one result of the underlying activity.[1]

Two other outstanding developments of the 19th and 20th Centuries, which Whitehead regards as important for the introduction of a philosophy of organism, were both achievements of theoretical physics. These were the theory of relativity and the quantum theory. Whitehead contends that, had more attention been paid to the organological theory the quantum theory could have become a weapon in the armoury of theoretical physics at an earlier juncture. This theory is important for the organological theory of nature, as that theory advocates the existence of multiple space-time systems, the theory of relativity demonstrating that there are truths in any given system which require reference to nothing other than the remainder of the totality of the complete scheme of relationships of things. Attention is drawn to this through Newton's first law of motion.[2]

Whitehead refers to the unexpected results of Michelson's experiments in interferometry as leading to the general recognition that a major re-organisation of concepts was required[3] especially in relation to those of space and time. Some form of relativity theory was necessary.[4] Whitehead contended that the closer inspection of space and time leads to the recognition of the mistake of attributing the same unique meaning to space and to time regardless of the condition of the observer. However, the acceptance of the theory of relativity dealt another severe blow to classical scientific materialism.[5]

1.SMW p135, 2.SMW p58, 3.SMW p145, 4. SMW p146.

According to Whitehead, it is the philosophy of organism which offers the necessary discrimination between space and time which the theory of relativity demands.[1]

The relevance of the quantum theory to the philosophy of organism is focused on the fact that in that theory, effects which would be expected to accumulate gradually, or diminish in a similar manner, are found in practice to increase in certain particular steps or jumps. The effect was first noted in relation to light liberated from an active molecule released in the dissipation of the excess energy. As Whitehead explains, a molecule which has been excited vibrates with definite frequencies. The molecule has definite modes of vibration and each mode of vibration has its own particular frequency.[2] Expressed in terms of light, the effect may be observed in the different colours of the spectrum which are produced. What would have been expected according to classical physics would be a steady increase in intensity directly related to the input of energy into the molecule. What was found were steps in energy levels which were fixed for each particular molecule which were not divisible.[3]

Thus, the question related to the energy of the excitation and not to the intensity, and whether it was sufficient or of a critical amount to liberate the photons of a

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5. SMW p148,
Evander Bradley McGilvary recounts several arguments against Whitehead's thesis on Relativity. Whitehead's conclusion that the basis of the current theory of relativity does not rest upon the results of the experiments which were its origin, does not find favour with the majority, who follow Einstein's conclusions on its interpretation. Whitehead insists that it is an error to associate space and time together so intimately as in 'space-time', each one being considered in turn whenever particular explanations find that a necessity. In that case we should recognise that each mode of abstraction is directing attention to some element in the constitution of space or time which is part of its nature. It should only be abstracted in the mode of 'space-time' for the purpose of contemplation. Evander Bradley McGilvary: Space-Time, Simple Location and Prehension, p209-239 In: The Philosophy of Alfred North Whitehead, Ed. Paul Arthur Schilpp, The Library of Living Philosophers Vol. III, La Salle, Illinois, 1951 Edition.
1.SMW p149. 2.SMW p161, 3.SMW p165,

particular frequency. Different modes of vibration in the molecule were found to have different, fixed frequencies. The challenge for materialistic theory was to fit this description of observed events into the traditional concept of the atom, which had by tradition, been explained in terms of locomotion of material.[1] The quantum theory appeared to be suggesting a limited number of tracks or grooves for the vibratory energy to take and the classical theory provided none. Whitehead compared the task of explaining these new concepts of the atom in terms of the materialistic theory, with that of astronomers of the pre-Copernicun, geocentric period, attempting to accommodate observed movements of the planets by a theory of epicycles.[2] According to Whitehead, such symptoms demonstrate a weakening of the assumptions of science.[3]

Whitehead described how the new discoveries concerning the atom can be accommodated in an organological theory of nature through notions of the vibratory locomotion of pattern and vibratory change of pattern.[4] Whitehead's

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1.SMW p163. 2.SMW p164 & 169,

3.Wolf Mays suggests that it was Whitehead's endeavour to include consideration of the ultimate factors in physical science which brought him into conflict with the classical concept of time, space and movement. These were clearly not compatible with the principles of relativity which has induced changes in our ideas relating to space time and matter. But Mays believes it is important to recognise that Whitehead appears to have changed the ground of his argument in his attempts to justify his own theory. Whitehead is relying on his intuition, in his preference for a monistic interpretation of the material world. But in such an interpretation space and matter are unified in such a way that it is legitimate to refer to 'space-time' as a single entity. In referring to such a term as 'Leibnizian', Whitehead is associating himself with the notion of things co-existing in an order of nature, rather than things such as space and time existing independently. Thus, according to Mays, in PNK and MC, we can recognise an earlier challenge to simple location and the fallacy of misplaced concreteness which is based on 'logical simplicity'. This can be contrasted with this later challenge which is based upon nature as perceived as a relational whole and which includes as its base the principle of relativity.
Wolf Mays, The Relevance of "On Mathematical Concepts of the Material World" In: Ivor Leclerk, (Ed.) The Relevance of Whitehead, , George Allen & Unwin Ltd. London, 1961, p242.

4.(The significance of 'pattern' for the philosophy of organism will be considered in section 5)

conclusion is that as a result of recent developments, physics requires something consonant with the organological philosophical theory.[1] The apparent discontinuity of matter introduced by the quantum theory requires a re-assessment of scientific concepts in order to account for it:

> "In order to reconsider its foundations, it must recur to a more concrete view of real things, and must conceive its fundamental notions as abstractions derived from this direct intuition. It is in this way that it surveys the general possibilities of revision which are open to it."[2]

It was on the basis of such discoveries and developments in scientific knowledge that Whitehead bases his conclusion that developments in the progress of science had reached a turning point, for the foundations of science which had provided its stability were braking up.[3] The basis of the recasting should be upon the ultimate reality which is organism. The difficulty is that for too long science in general has simply been satisfied with its own individual abstractions because of their apparent success in the field of application.[4]

For example, entities as considered in science, are based upon the notion of atomic material but are in fact simply the enduring entities of nature considered in abstraction. They are separated from everything else, other than those things which can influence the historical routes of the entities. Thus, the laws of physics are those which describe how the entities react mutually together. These laws according to physics are arbitrary as a result of the abstraction from the other things. But if it has been agreed that these other things are modified by the environment in which they are, then we have to question whether it is justifiable to retain the assumption that there will be no modification of these scientific laws as a result of environmental changes. It is held to be a categorical doctrine by the philosophy of organism that there will be changes in the laws as a result of changes in the environment.[5]

1.MW p166, 2.SMW p159, 3.SMW p21, 4.SMW p83, 5.SMW 133.

> "Thus, in order to understand the difficulties of modern scientific thought and also its reaction to the modern world, we should have in our minds some conception of a wider field of abstraction, a more concrete analysis, which shall stand nearer to the complete concreteness of our intuitive experience."[1]

This grasping of a wider field of abstraction was potentially, the turning point in the progress of science.

Summary

In this section we have considered Whitehead's assessment of what he regarded as the most significant notions and doctrines which emanated from the 17th Century Scientific Revolution. Their importance for the philosophy of organism relates to the direction into which science was led on their account. However, in parallel with the development of these new fundamental assumptions and notions, there continued to be significant discoveries of phenomena, with their associated theories of explanation, which were not easily assimilated into the new scientific scheme. This presented a challenge to the newly established scheme, while simultaneously adding evidence to those philosophers and scientists such as Whitehead, who were convinced that the new scientific scheme developed from the Scientific Revolution of the 17th Century, should be re-cast. We noted that in Whitehead's case, he recommended that the re-casting should be on the basis of the ultimate concept, which is that of organism.

1. SMW p83.

2 Whitehead's criticism of the philosophical concepts underlying Induction and Cartesianism.

Introduction

In this section we will consider Whitehead's criticism of these two issues, investigating the nature of induction, its status as the basis of modern scientific method and its importance. Hume's criticisms of induction will introduce discussion on the reasons for the rejection of inductive methods as the foundation for the establishment of universal laws of nature. Alternative structures as the basis of a new scientific method will be considered. The relevance of this debate for the philosophy of organism will be discussed with the reasons why the failure of inductivism in scientific method does not constitute a difficulty for the philosophy of organism. The discussion on induction will be followed by an assessment of Cartesian Dualism, which will question the apparent success of the Scientific Revolution, on the basis that it bequeathed to Europe the problem of matter and mind.

Induction

Induction is described as a method of reasoning by which it is possible to establish a general principle from what is inferred from observed particular instances. The term is used to describe any argument in which the truth of the premise or premises provides sufficient reason for its acceptance. This is unlike a deductive argument in which the truth of the conclusion is simply a development of truth inherent in the premise.[1]

Whitehead clearly describes the nature, place and role of induction and its fundamental role in the establishment of the foundations of modern science:

> "Without a shadow of a doubt, all science bases itself upon this procedure. It is the first rule of scientific method, - Enunciate observed correlations of fact. This is the great Baconian doctrine, namely, Observe and observe until finally you detect a regularity of sequence"[2]

Whitehead selects Francis Bacon as an example of one who was convinced that with

1. Anthony Flew, Ed: A Dictionary of Philosophy, Pan Books 1979, p171/2.
2. AI p116,

sufficient care and attention to the collection of evidence, general laws would reveal themselves.[1] Such a faith is based on the notion of there being many things in the world which behave together in such a way that their observation exemplifies fixed rules. Through continued evidence it would become apparent that these rules demonstrate recurrences which never fail to recur.[2]

Although Bacon appears to have had some concept of taking part in a radical revolution, Whitehead believes that he could not have been fully aware of the difficulties this new method of scientific procedure was about to introduce. Induction has proved to be a more complex method than Bacon and others who followed him anticipated.[3] The establishment of the inductive method for the formulation of scientific law derived from the use of the experimental method and the study of brute facts, and was the result of a 'ground swell' of opinion in the 16th and 17th centuries which came to accept the truth that general laws could be established in this way. There was a recognition of the need for such a systematic and methodical approach to the study of science, through which the search for the theoretical principles in which they all believed could be conducted. Thus, the new movement became dominant.[4]

Hume's response to the adoption of induction had been to reject science as rationally justifiable.[5] He questioned the presumption, inherent in inductive reasoning in science, that there is a uniformity in nature. Such an assumption is not true knowledge in the way that experiential knowledge is, and the distinction should be recognised. What we experience is but a sample of the totality of the universe and we should question whether this is an accurate representative sample. Thus, inductive reasoning presumes that the future is derived from the present, thereby providing a continuity of inheritance in which conditions are maintained. In the language of the philosophy of organism this implies the maintenance of the general social order, which refers to the continuation of the material world required for such judgements to be undertaken.[6]

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1. SMW p54, 2.AI p41, 3.SMW p54, 4.SMW p53, 5. SMW p54, 6. PR p204.

According to Anthony Flew, Hume's challenge was on the basis of the continuity of cause and effect. Hume explained the problem in terms of a 'syllogism', concluding that the argument which claims to justify induction is found to be circular. Observational experience is adequate until observation itself demonstrates its own inadequacy. The classic example of 'all Ravens are black' illustrates the difficulties absolutely. We are not justified in affirming that all Ravens of all types have to that moment been observed, for we must leave room for the eventuality that we could have an experience of a different kind of Raven. Failure to provide for this eventuality is to cease basing the argument on experience. We are then passing to the realm of likelihood and possibility.[1]

According to Flew, the successors to Hume have explored every avenue in their efforts to meet his challenge. They point to the remarkable success of the inductive method in the service of science. If inductive arguments have been successful in the past why should they not continue to work in the future? This suggested to some that the only thing which still required justification is the inductive defence of induction i.e. the means of justifying induction is through the use of inductive reasoning. This presentation of the difficulty based on Hume's argument is what is now referred to as the 'Problem of Induction'. Flew suggests that Whitehead's solution to understanding inductive procedures is through the application of metaphysical principles, which express a faith in the fundamental uniformity of nature.[2]

Whitehead welcomed Hume's criticisms, using Hume's arguments to formulate his own challenge to the reliability of induction for the establishment of universal laws of nature,[3] He expressed surprise that we had to wait until the 18th century for someone to appear to challenge something that is so misguided as induction for the establishment of universal laws.[4] According to Whitehead, induction is the mechanism by which we are able to establish the characteristics of a particular future from the knowledge and characteristics

1. Anthony Flew, Ed: A Dictionary of Philosophy, Pan Books 1979, p172.
2. Anthony Flew, Ed: A Dictionary of Philosophy, Pan Books 1979, p172.
3.SMW p65, 4.SMW p85.

of a particular past. It is unsafe to go further than this and formulate general laws which hold in all circumstances. However, the present occasion can only determine a particular 'community of occasions' whose mutuality is established by their inclusion in the same community in space and time alone. Science reveals the transition of one such community to another.[1]

A conclusion that there is no link between time past and time present would be disastrous for science. It would negate the most positive conclusion that Whitehead believes it is possible to draw form induction, namely that of the link between past present and future: "Either there is something about the immediate occasion which affords knowledge of the past and the future, or we are reduced to utter scepticism as to memory and induction."[2] It is this link between past present and future that can affirm our conviction that general principles could be established from the study of the details of occurrences in relation to their antecedents and that this is the greatest contribution to the scientific movement of all time.[3] Whitehead believed that every event or occurrence which can be associated with the present is somehow associated and connected with specific antecedents of the past in an orderly manner, and this suggests operation under a general principle. It was this instinctive conviction that gave hope and meaning to efforts of scientists, providing the necessary impetus to their enquiring minds. All our activities are based upon it inductivism, though it is the despair of philosophers.[4]

It was Whitehead's view that induction forces us to face the challenge of applying reason to the difficult task of the analysis of the present situation in order to establish its general characteristics. Such a task is essential as a preliminary, if any sense is to be made of induction. He insists that the key to any understanding of the process of induction, whether it is used in science or in daily life, is to be discovered in a full analysis of the immediate occasion.[5]

According to the philosophy of organism every inductive judgement includes the

1. SMW p56, 2.SMW p55, 3.SMW p56, 4.SMW p30, 5.SMW p55.

presupposition that the general order of the immediate environment will continue in so far as it relates to actual entities within the scope of the induction.[1] Survival requires order, but to presuppose such survival outside the type of order which is required for that type of survival, would constitute a contradiction. It is in such an analysis that the philosophy of organism differs from any form of Cartesian 'substance-philosophy' which underpins the attained confidence in the validity of induction:

> "For if a substance requires nothing but itself in order to exist, its survival can tell no tales as to the survival of order in its environment. Thus no conclusion can be drawn respecting the external relationships of the surviving substance to its future environment."[2]

For Whitehead, this is the only way that induction can be rationally justified i.e. by establishing the fundamental characteristics of the immediate occasion as portrayed by cognition, though this will not be easy to do.:... "I do not wish to throw any doubt on the validity of induction when it has been properly guarded."[3] Our question is to interpret the meaning of 'properly guarded'. To elicit the general characteristics of the immediate occasion is described by Whitehead as a 'baffling task', but it is a necessary preliminary procedure in order to justify induction. Vague instinctive faith concerning the occasion will not do, only knowledge of its 'full concreteness' will be sufficient: "It is impossible to over-emphasise the point that the key to the process of induction, as used in science or our ordinary life, is to be found in the right understanding of the immediate occasion of knowledge in its full concreteness"[4] Hence, in the philosophy of organism, to anticipate the future concerning a particular piece of rock is to presuppose an environment required by the piece of rock. Thus there can be no inductive judgement in relation to an unknown environment i.e. if the environment is not known an inductive judgement would not be contemplated. Induction is concerned with the statistical probability of such an environment.[5] Whitehead suggests that there are in fact no answers to questions relating to unspecified entities in unspecified societies.[6]

1.PR p204, 2.PR p205, 3.SMW p55, 4.SMW p55, 5.PR p204,
6.PR p205. Whitehead explains that this is a covert appeal to probability and that detailed explanations of that principle's operation in inductive reasoning require the application of the statistical theory.

What induction does do is to establish some of the characteristics of a particular future based upon the known characteristics if a particular past [1] If w are not convinced that there is something about the immediate occasion which informs us about the past and the future, then we will be left with only scepticism about both induction and memory.[2] It is in the wider question concerning the application of general laws which apply for all cognisable occasions that induction becomes unsafe, for our knowledge is too limited to justify the inductive step. Unless some recognition of these limitations is made and we make sense of them, induction will remain a serious difficulty. Whitehead suggests that these comments should have made it apparent that he does not believe it is within the nature of induction that it should be employed to derive general laws of nature.[3]

This last statement may appear to negate and be in contradiction with Whitehead's earlier comment that inductive procedure is the basis of all science.[4] Clarity is achieved if we recognise that, according to Whitehead, science does not possess the ability to devise general laws of physical nature through the method of induction. The recognition that it is the basis of all science only emphasises the limitations of science. Thus, according to Whitehead, we should differentiate between our search for the general principles which lie at the heart of the order of nature, and the judgement of induction in relation to its role in the establishment of laws of nature. For not only is induction not a suitable tool for the establishment of general laws of nature, but its employment in this role is to claim knowledge of some characteristics of a particular future from the known characteristics of a particular past.[5]

The 20th Century heard other voices raised in questioning whether progress in science really is based upon the inductive method, or whether in fact we have not been asking more of this method than it is able to give. Ann Plamondon refers to Hempel, who in seeking a solution stresses the 'non mechanical' or 'imaginative' aspects of scientific hypotheses. According to Hempel, we should substitute the formulation of

1.SMW p56, 2.SMW p64/5, 3. SMW p56, 4.AI p116, 5.SMW p56,

hypotheses, which he describes as induction in a wide sense, with the practice of making non inferential innovations or guesses, which he refers to as a narrow sense. The previous practice of accepting hypotheses in the wide sense involves the incorporation of inferences which do not constitute valid deductive reasoning. This removes induction from the realm of discovery and places it in the context of the confirmation of theory.[1] Plamondon compares Hempel's rejection of a formally 'mechanical' method of applying induction with Whitehead's reference to 'valid inductive methods' having by necessity to be analogous, each introducing a limitation on the occasions when the method will prove suitable.[2]

A significant question for the new doubters in induction relates to Whitehead's assertion that induction, independently of metaphysics, cannot provide us with clear notions of the laws of nature which are sufficiently sound to be worthy of our trust. Many follow the lead of Karl Popper in accepting the validity of Hume's arguments, but then suggest that the destruction of confidence in induction, suffered as a result of Hume challenge, is unnecessary because in fact science proceeds by a method of 'falsification' rather than of induction. Popper concentrates on the observer in any given situation. He recognises their subjectivity, stating that infallible observational statements cannot be made directly from sense perception.[3] The private observational statement of the individual can only be tested by public acceptability. Moving from the private to the public realm gives it general acceptability, but this is achieved through widespread testing. Thus the basis of Popper's position is the question of the ability of a statement to survive tests. Justifiable criticism relates to the almost total reliance on subjective decisions at the private and public levels, though this conforms to Popper's insistence that science is a process which has no subject. However, this approach suffers from the same difficulties as all falsification methods, in so

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1.Ann Plamondon, Whitehead's Organic Philosophy of Science, State University of New York Press, Albany, 1979, p92. 2.PR p310, 312, 314.
3. Anthony Flew, Ed: A Dictionary of Philosophy, Pan Books 1979, p172.
2. A. F. Chalmers, What is this thing called Science, Open University Press, Second Edition 1982, p61.

far as the statement which challenges the first observational statement itself, has to pass the test of falsification. Chalmers cites as an example the interesting case of the conflict between the Ptolomaic and Copernican systems, neither of which could produce satisfactory empirical evidence in order to clinch the argument.[1] Thus, the statement Popper used in the defence of his case is of great significance for our discussion:

> "The empirical base of objective science has thus nothing 'absolute' about it. Science does not rest upon solid bedrock. The bold structure of its theories rises, as it were above a swamp. It is like a building erected on piles. The piles are driven down from above into the swamp, though not down to any natural or 'given' base; and if we stop driving the plies deeper, it is not because we have reached firm ground. We simply stop when we are satisfied that the piles are firm enough to carry the structure, at least for the time being."[2]

However, Ann Plamondon recognises that there is no support in this for the main thesis of the philosophy of organism, for the rejection of induction by Popper is largely on the basis

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1. A. F. Chalmers, What is this thing called Science, Open University Press, Second Edition 1982, p62.
The recognition of the inadequacy of the employment of empiricism alone for the formulation of solutions to recognised cosmological problems was soon apparent. For example knowledge available at the time of the Copernican controversy could not solve the questions of the true size of the planets Mars and Venus. Only when telescopes of high resolution were available could this be achieved. Further, both sides in the dispute appealed to the same method of verification for the veracity of their argument i. e parallax. According to Lakatos and Zahar the change to a Heliocentric system of understanding the solar system represents the largest paradigm shift in scientific thinking that has so far been recorded in the history of science. Yet it was only the discovery of Stella Parallax by Bessel, that a crucial difference between the two theories could be established. Up until then there had been no empirical basis for determining whether the Copernican revolution was a revolution in name only. Neither the Positivists nor the Inductivists - whether Probablist or Falsificationist - could produce a convincing reason for the preference of one over the other. The discovery was made soon after Copernicus' work had been removed from the banned list of books by the Church. That it then took until 1838 to make a judgment in favour of the Copernican system appears to raise what Lakatos and Zahar describe as 'Socio / Psychological' questions for science.
Imre Lakatos and Elie Zahar, Why did Copernicus' Research Program Supercede Ptolemy's? In: The Copernican Achievement, (Ed. R. Westman) California University Press, 1975, pages 355-383.
2. K. R. Popper, The Logic of Scientific Discovery, London, Hutchinson, 1968, p111, In: A. F. Chalmers, What is this thing called Science, Open University Press, Second Edition 1982, p63.

of Hume's criticisms of it. According to Popper, the notion that the principle of induction with observed data could provide a deductive inference for a general conclusion, leads either to an infinite regress, which is the outcome of the empirical interpretation, or to a metaphysical conclusion, which is based upon an a priori synthetic argument involving triviality or circularity. It is this latter conclusion which does not lend support to the philosophy of organism, for Whitehead has conceived a Categorical Scheme which is based upon generalities derived from experience. Whitehead makes little distinction between scientific method and metaphysical theory, for the categories of each are arrived at in the same way even though only the metaphysical categories are fully general.[1]

Nelson Goodman suggested that we have always expected too much from inductive methods in science. A quest for an alternative formulation of induction stems from the recognition that the nature of the problem of Induction may have been incorrectly formulated. An inductive inference or prediction is only justified by conformity and obedience to laws of induction, which are valid if they comply with accepted codes of inductive practice. This means reducing our expectation concerning what can actually be achieved through induction. In fact we owe belated apologies to Hume. The new task had become the establishment of the rules by which it can be ascertained, as to what are and what are not valid inferences.[2] Goodman has recognised the theory laden nature of observation. According to Plamondon, the same term can have a different meaning in different circumstances, and because generalisations are falsified by counter instances and laws and principles are not, discovery, according to Goodman, is not inductive generalisation.[3]

The failure of Popper's method of 'falsification' to provide a satisfactory solution to the inadequacies of the inductive method has prompted various suggestions for a new

1.Ann Plamondon, Whitehead's Organic Philosophy of Science, State University of New York Press, Albany, 1979, p93.
2. Nelson Goodman, Fact, Fiction and Forecast, Harvester Press, Third Edition, 1979, pp62-83
3.Ann Plamondon, Whitehead's Organic Philosophy of Science, State University of New York Press, Albany, 1979, p95.

approach. Imre Lakatos for example, described an explanation of the way in which science has actually been functioning through 'research programmes'. These include a core thesis which can survive attacks from peripheral debate until the weight of the entire evidence from those debates demands a change in the core theory itself. Thomas Kuhn proposed what might appear to be a similar description, based upon the notion of paradigms and paradigm shifts. However, upon closer analysis they do represent different attitudes to the nature of science and its development, Lakatos attempting to be a 'rationalist' while Kuhn is described as a relativist. This is summed up by Chalmers: "...Lakatos aimed to give a rationalist account of science but failed, whilst Kuhn denied that he aimed to give a relativist account of science but he gave one nevertheless."[1] Recognition of the philosophical challenges to the principle of induction in science has introduced an era in which there has been a shift from attempting to justify induction to one of finding a substitute theory to explain progression in scientific development. The question must be put as to when if ever it reasonable to appeal to inductive reasoning in science. It is at this point that the philosophy of organism has a contribution to make. According to Plamondon following Hesse, it is when questions of the environment are included in some way.[2]

Whitehead draws attention to the perplexities arising from the connection of things and the establishment of laws of nature.[3] Philosophers of science are misled when they are made to believe that there are premises and certainties on which they can proceed to build a reliable deductive system of schemes of thought. To believe that is to misunderstand the order of things. On the contrary, it is the role of science to assist in the discovery of the true generalities and this should be the goal rather than the discovery of the universal laws of nature. These generalities will be the result of philosophical debate about science, they are not the staring point of a discussion. This is the true role of the philosophy of science and its rediscovery will enable science to regain its true status.[1]

1.A. F. Chalmers, What is this thing called Science, Open University Press, Second Edition, 1982, p109.
2.Ann Plamondon, Whitehead's Organic Philosophy of Science, State University of New York Press, Albany, 1979, p99. 3.PR p205.

According to Whitehead, induction includes an appeal to history, but such an appeal is only justified if there is agreement that there is a history to which we can appeal. Similarly, we can only embark upon speculation concerning the future if there is agreement or knowledge that there is a future to which we can appeal. Some sense has to be made of both these ideas to prevent induction being regarded as a nonsense.[2] Other scientific concepts involved in an inductive judgement will require the application of all the knowledge and understanding of physiology and psychology that we can muster. Thus the philosophy of organism recognises that both the judging subject and the data are part of the same social environment, or more precisely, the judging subject is part of the social environment of the data on which the judging subject is passing judgement. Hence, the species of data required for the presumed judging subject presupposes an event of a certain social character. For Whitehead, inductive reasoning has attained its validity on account of a hidden premise:

> "This tacit presupposition is that the particular future which is the logical subject of the judgement, inductively justified, shall include actualities which shall have close analogy to some contemporary subject enjoying assigned experience;"[3]

Ann Plamondon believes that investigation into induction as a scientific method for the establishment of laws of nature and also Whitehead's justification for its use with caution, demonstrate the importance of internal relations for Whitehead, in establishing a valid inductive inference. The relationship between any organism and its environment is an essential one as the inductive inference is valid as a result of this internality, i.e. an internal relationship is essential for a valid inductive inference. However, internal relations between organisms may be helpful but alone it is not enough. There is still the question as to whether there are sufficient grounds for analogous comparison. She suggests that the degree of similarity can be established through the use of a Keynsian principle for the limitation of independent variety.[4] Without this, Hume's criticism is totally destructive of induction. Thus, Whitehead's 'environment' is the only way to salvage something from induction, used alongside Goodman's distinction between valid and invalid predictions. By implication Whitehead is saying that it is the existence of organism which gives

1. PR p205, 2. SMW p56, 3. PR p204.

meaning to an inductive inference.[1] With the strictures introduced through the Keynsian principle, it is necessary to ensure that laws operating in any one part of a complex be related to those similar parts in another complex.[2] Thus, the philosophy of organism can accept the valued operation of induction in theoretical inferences between organisms, on condition that they fulfil the criteria. Other views tend to omit:..."the necessary metaphysical presuppositions of internal relations which is entailed in the organic concepts of organism and environment."[3]

The rejection of the organic philosophical viewpoint by Keynes in his 'Treatice on Probability', in favour of the atomic, is the result of Keynes' opinion that the two are exclusive. Such a combination would make any reliance upon induction useless. However, Wolf Mays regards Whitehead's position is 'an intermediate one' in so far as it accepts the concept of the possibility of knowledge of a neighbouring region, in the form of societies and their backgrounds, thus giving a limited credibility to induction.[4] This credibility is based to some degree on the uniformity events may have with each other, without which systematic knowledge of nature would also be impossible.[5]

The future logical subject Whitehead describes as one being analogous to the one in question, i.e. the initial judging subject, or to some sort of actual occasion anticipated in the actual world, with close analogy to the contemporary environment. It is not being suggested by the philosophy of organism that the laws which are applying now in our cosmic epoch cannot be deduced, for Whitehead affirms that: "....there is no reason to doubt that the laws are the outcome of the environment of electromagnetic occasions."[6]

4.Ann Plamondon, Whitehead's Organic Philosophy of Science, State University of New York Press, Albany, 1979, p102.
1.Ann Plamondon, Whitehead's Organic Philosophy of Science, State University of New York Press, Albany, 1979, p103.
2.Ann Plamondon, Whitehead's Organic Philosophy of Science, State University of New York Press, Albany, 1979, p105.
3.Ann Plamondon, Whitehead's Organic Philosophy of Science, State University of New York Press, Albany, 1979, p106
4. (Wolf Mays 1959, p242), 5. (Wolf Mays 1959, p82), 6. AI p41.

The reference to the 'environment of electro-magnetic occasions' relates to Whitehead's doctrine of epochal societies, which Lewis ford describes as: "...Whitehead's most distinctive metaphysical claim."[1] Our present cosmic epoch is described as being formed by an 'electromagnetic' society. This society is a special society contained within the totality of the geometric society of the universe, in which there are special dominant defining characteristics. These characteristics can only dominate because of two wider societies in which the electromagnetic society exists. The influence of this 'neighbourhood' is not systematic but is still real and it influences 'Law': "In so far as this dominance approaches completeness, the systematic law which physics seeks is absolutely dominant. In so far as the dominance is incomplete, obedience is a statistical fact with its corresponding lapses."[2]

According to the Philosophy of organism, without the wider society, our own electromagnetic society would not be able to provide the stability required for the production of occurrences and their intensities of experience unless the wider society exerted its influence. In other words there is a dependency relationship between all societies. The physical world reveals an amazing complexity of such societies some co-operating some competing with each other.[3] Thus, continuation of the general order presupposes the continuation of the cosmic order. The uniqueness of Whitehead's metaphysical claims regarding the epochal theory derive from the extreme difficulty of conceiving such a structure with its dominances and interdependencies, from observations of particular occurrences of experience of behaviour, of: "...trains of waves, individual electrons, protons, individual molecules, societies of molecules such as inorganic bodies, living cells and societies of cells such as vegetable and animal bodies."[4] Could such phenomena produce knowledge of the general laws which affect the behaviour of the wider societies, which in turn dominate the electromagnetic society in which we participate? In Whitehead's cosmology he is seeking the general notions of nature and

1.Lewis Ford, The Concept of 'Process': From 'Transition' to 'Concrescence', In: Whitehead and the Idea of Process, Ed. Harold Holz and Ernest Wolf-Gazo, First International Whitehead Symposium 1981, p75.
2.PR p98, 3. PR p97, 4.PR p98.

these could hardly be discerned only from the occurrences of our limited society. Whitehead agrees that the laws we observe are the outcome of the behaviour of things. The laws pertaining to this electromagnetic society are better understood as 'Communal Customs' rather than imposed law, where custom relates to what we know of how the various occasions in nature contribute to each other's nature. Thus, the whole of the environment participates in the nature of each of its occasions.[1] This clears Whitehead of any contradiction of both affirming that the basis of all modern science is inductive reasoning while also demonstrating the legitimacy of his challenge to simple location. What science has referred to as 'laws of nature' are in the philosophy of organism, laws relating to the electro-magnetic epoch of our part of the universe.

Paul Arthur Schilpp notes, in his discussion on moral philosophy, that just as morality is relative to the particular cultural epoch from which it is derived, and as such is always 'dated', so also does all classification age, including laws of nature which depend upon the current characteristics of what is regarded as important, i.e. the environment in which the laws of morality are formed. Even Logic and Mathematics do not escape this fact when used as processes of induction, for they lose their absolute generality. According to Whitehead; "...the absolute generality of logic and mathematics vanish. Also induction loses any security. For in other circumstances there will be other results."[2] For Whitehead the temporal relativity applies to all things in the created order. Thus Schilpp participates in Whitehead's caution surrounding the inductive method in its use in science for the formation of laws of nature.[3]

Ann Plamondon likened the change required in conceptual thinking, in order to do justice to Whitehead's thesis of organological philosophy, to that described by Kuhn as a paradigm shift. Such shifts are demonstrated in the history of science when there is a revolutionary change in the assumptions which are at the base of the interpretations of scientific discovery and advance. However she notes a contrast in the interpretation of the data of science between Kuhn and Whitehead, as the former regards himself as an

1.PR p98, 2 .MT p134, 3. Paul Arthur Schilpp, In: (Schilpp, 1951, p604/5).

instrumentalist philosopher, while Whitehead would prefer to be called a realist, with certain qualifications. According to Plamondon, it is the realism of Whitehead which strengthens his interpretation of development and progress in ontology through the progress of the development of science.[1]

According to R Palter, we should display caution in selecting material from Whitehead's thesis on induction, for we may be tempted to make it do more than it is capable regarding general laws. It is possible to argue, following Whitehead, that: "...all natural entities and hence all of the creative laws of nature have evolved, so that the laws are statistical, restricted in scope, and hence not strictly universal."[2] Before accepting such a proposition we should note that some laws of physics do appear to be universally applicable. On the other hand, Whitehead appears to have selected examples to support his organological thesis from entities such as animals plants and stones, which characteristically do not remain the same throughout their duration. Palter believes that the selection of other different examples of entities, which are not 'self-identical' over a period of time, would have strengthened his case.[3] In his comment Palter also appears to question whether there is any evidence for the evolution of matter itself.

Further, Palter questions whether the philosophy of organism is not risking the accusation of constructing a circular argument, in so far as it describes the speculative philosophy which it utilises as relying upon 'imaginative generalisation'. This generalisation is seen to originate in particular factors which can be recognised in selected topics of human interest. If this be the case, does it not imply that the philosophy of organism itself is dependent upon a form of inductive reasoning, presumably because generalisations are assumed as a

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1 Ann L Plamondon, Whitehead's Organic Philosophy of Science, State University of New York Press, Albany, 1979, p129.
2. R Palter, Whitehead and the Philosophy of Science, International Studies in Philosophy, Spring 1980, Vol.12, p84.
3 R Palter suggests that Ann Plamondon has done both of these things in her defence of Whitehead's Philosophy of Organism.
R Palter, Whitehead and the Philosophy of Science, International Studies in Philosophy, Spring 1980, Vol.12, p84.

basis for other deductive arguments.[1] This suggestion may have some justification, in so far as both speculative philosophy and inductive reasoning are methods, but outside the context of a more detailed analysis of the totality of the fundamental structure and data of the philosophy of organism, it would appear to be an extremely narrow analysis of the foundations of the philosophy.

However, Whitehead's justification for the continued reliance upon inductive methods in science is on the condition of its limitations being recognised. Once they are recognised then statistical analysis can be of help in relation to the probability of a particular situation or set of circumstances being repeated. Our concern is with the recognition of the acknowledgement of the limitation of the inductive method for the establishment of universal laws of nature, a role which Whitehead denies it. Thus, Palter's second observation, that there do appear to have been established laws of physics which are universal in scope, is of more significance.

However, the conclusions that have been reached on the dependency of science upon induction and the apparently new more general recognition of the problems of induction, in relation to what it can provide for us as knowledge of nature, only takes us further in a justification of Whitehead's position that, i) we require metaphysics and philosophy to assist in interpreting perceived reality, exemplified by Whitehead in the illustration of the development of our understanding of Gravity from the time of Aristotle to the present day;[2] ii) both philosophical and scientific systems are the same, in so far as their orthodoxies come and go as new information and ideas are developed. There is a sense in which science and philosophy operate together in the same great endeavour of the human mind. iii) In so far as a demand for an intellectual justification of experience has been the motive power for the advance of European science, scientific interest is only a variant form of religious interest, for religion is driven by the same force, both expressing a

1. R Palter, Whitehead and the Philosophy of Science, International Studies in Philosophy, Spring 1980, Vol.12, p84.
2.SMW p57 & 153.

devotion to truth in their own domain,[1] and iv) if a rational person may be described as one in search of the fulfilment of their faith, as all rational people do hope, and metaphysics is what enables us to devise the rationality of things, then intuition which is the hallmark of this faith, is where metaphysics and science pass over into religion.[2] Thus the philosophy of organism is not damaged by any new recognition that Induction may not, after all, be at the heart of the formulation of all general laws.

Cartesian Duality

In this part we will consider the significance of the adoption of Cartesian substance philosophy for scientific philosophy and the consequences of splitting the entity from the factors which constitute the substance, as occurs in the bifurcation of nature. The influence of Greek and especially Aristotelian philosophy upon Descartes will be traced traced, with an assessment of its consequences for European philosophy of science. Consideration of the reasons offered by that philosophy of organism for the inconsistencies of the Cartesian system will follow, the part concluding with Whitehead's argument that it is from the dichotomy of matter and spirit that the mind / body problem springs, the consequences of which will be considered.

We have previously noted that according to the philosophy of organism, laws of nature are a product of the social environment in such a way as to presuppose a particular type of environment and set of actual entities is to know something of the laws of nature which will be applicable in that environment.[3] Further, according to that philosophy, just as the continuation of the environment requires order, so also every inductive judgement assumes that the general order of its environment will be sustained. According to Whitehead this is not so in Cartesian substance philosophy, which conceives a substance as requiring nothing outside itself as necessary for the continuation of its own existence. In other words there is no connection between the survival of matter and order in the community, hence, there is no connection between one substance and another and the environment: "For if a substance requires nothing but itself in order to exist, its survival

1.PR p15/16, 2.PR p42. 3. PR p204,

can tell no tale as to the survival of order in its environment. Thus no conclusion can be drawn respecting the external relationships of the surviving substance to its future environment."[1] This is in contrast to the philosophy of organism in which there is no possibility for a completely unknown environment entering into an inductive judgement.

According to Whitehead, Cartesian substance philosophy reduces inductivism to a vague hope concerning the unknown future, for it has no answer to the question as to what will happen to unspecified entities in randomly selected environments. What is overlooked by Cartesianism, but recognised by the philosophy of organism, is that the entities with which inductivism is concerned are themselves part of, and essential for, the continuation of the environment in which they are a part.[2] Cartesian substance philosophy can only underpin faith in induction by the suppression of the presupposition that the particular future which is required by particular entities for inductivism to be reliable will, in fact, be the future. It assumes that actualities which either have close similarity to the entities in question in their contemporary environment, or to some form of actuality presupposed and assumed by the subject of the inductive judgement, will constitute the future.[3] It is this appeal to the unknown which is ruled out by the philosophy of organism.[4]

Whitehead described Descartes as introducing a philosophy of independent bodies and minds as substances, which are also independent of each other, the philosophy being based upon a confusion between the individual entity with its individual experiences which later are endowed with an independent substantial existence. Concentrating first upon his own conscious experience which produced the facts in his own mind, Descartes then related these to his total self as an entity in a private world of its own reality. This world involved emotions and independent substances. The world of values was then removed through an emphasis upon the independence of the bodily substance. Whitehead believed that the resulting Cartesian philosophy, concerned with valueless bits of matter, was a notion already gaining acceptance in the world of science before the Cartesian formulation of it was complete.[5]

1.PR p205, 2. PR p205, 3.PR p204, 4.PR p205, 5.SMW p242.

The result of the combination of ideas derived from Aristotle and Descartes has been the production of a coherent philosophy in which there has been a separation of the 'entity', where entity is the object perceived, from the 'factor', by which Whitehead means the attribute by which the entity is perceived, such as colour.[1] Thus, the entity has become the substratum of the factor and the factor is reduced to an attribute of the entity. This introduces a false distinction in nature which should simply not be there. In truth a natural entity is simply a factor of fact, which should be considered by itself and in its own right in its own context.

According to Whitehead, the quest to discover the nature of simple substances was the central question occupying Greek thought. They believed that establishing the nature of substance could be the key to expressing the course of events of the natural world. Whitehead believes that it was the response of both Plato and Aristotle to this question that has shaped and dominated the pre-suppositions regarding time, space and matter ever since. It was also this quest to establish the nature of substance that led the Greeks to question what nature is made of.[2] Whereas Plato concluded that the basic building blocks of nature were atoms, an answer well suited to the concepts of modern science, Aristotle answered the question by proposing the idea of 'substance' as the thing underlying all of nature. He went on to apply his own logic to this answer, concluding that a predicate must be attached to a subject, but in the case of substance there was to be an exception. Substance was to be recognised as the thing or material which did not require a predicate. This gave to substance the meaning of something which was a substratum for everything else.[3]

Further, according to Whitehead, Aristotle's ideas were so totally accepted, that ever since we have continued to search for a substratum which would describe everything revealed to us in our sense-perception of nature. It is the source of modern scientific theories of matter and ether. In the case of ether, its creation was the result of a postulation of something to be the substratum in and through which the events of nature occur.

1.CN p16, 2.CN p17, 3.CN p18.

Whitehead regarded this habit of postulation in Aristotelian thinking as particularly prevalent in statements relating to space and time, which are not verifiable by normal means of scientific testing.[1]

Descartes produced a duality of substances by recognising two species of entity, matter and spirit or soul. The essence of the former is spatial existence and that of the latter 'cogitation' or thinking. Whitehead describes them as unique, in so far as neither requires anything beyond itself to explain its existence, both revealing their existence through duration. The essential characteristic of bodies is extension and that of mind is cogitation.[2] According to Whitehead, Descartes had constructed his philosophy in such a way as to presuppose these two as independently existing substances. They are located within the entities which make up temporal duration. Both these entities participated in the general flux of things. Time was regarded by Descartes as being a product of the observer. This is a theory of 'Materialistic Mechanism' as observed by thinking minds.[3]

According to Whitehead, Descartes was not actually describing the primary attributes of physical bodies, but rather the internal relationships between actual occasions or events, which were themselves part of other larger occasions or events. By altering the description of the way in which the mind informs the body, to comply more closely with what physiology teaches us, a more accurate way in which the body inherits the richness of its various occasions can be introduced, thus avoiding the Cartesian distinction between mind and body. In this way the notion of what is perceived by the body as one substance with mind, which is another substance, is also avoided. It removes the concept of static materialism by changing it to the fluent energy of the philosophy of organism.[4] The concept structure of organic realism is derived from 'action and flow' which may be expressed in the terminology of mathematical physics, in the saying of Heraclitus that 'all things flow'. This is changed in Whitehead's explanation of the nature of organism, into 'all things are vectors'.[5]

1.CN p19-22, 2.SMW p179, 3.SMW p180, 4.PR p109, 5.PR p151.

According to Whitehead, the difficulties in which Descartes found himself stem, in part at least, from the acceptance of false notions suggested in a major contrast in the words 'particulars' and 'universals'. The word 'particular' suggests something which is itself, without any relevance or need of reference to anything else. This answers well to the Cartesian definition of substance. Descartes has stated in his Principles of Philosophy, that conceiving a substance is merely to conceive an existing thing which requires nothing other than itself in order to exist.[1] This represents an arbitrary disconnection from any first principles. Thus, a two substance philosophy is an example of incoherence in philosophy, for Descartes offers no reason as to why, for example, it should not be a one substance philosophy. He could have classified everything according to a single experient which is the absolute, as did Spinoza, or, he could have had an indefinite number of substances as universals, as achieved by Leibniz with his monad.[2] Even a choice of a one substance philosophy could have been on the basis of a one substance world as only corporeal or only mental. Thus, according to Whitehead, the Cartesian system makes a virtue out of its incoherence.[3]

According to the philosophy of organism, the traditional use of the terms 'universal' and 'particular' are in reality blurred and inconsistent. By the application of its ontological principle, which states that ultimately the answer to every question is referred in some way to an actual entity, the entity is involved in all creativity. This entity is the equivalent in the philosophy of organism to Cartesian Substance.[4]

Whitehead argues that a 'universal' is particular, in the sense that it is what it is, in so far as it is separate and diverse from everything else, but every 'particular' is also universal, in so far as it enters into the formative stage of any other actual entity. It is the traditional interpretation of the nature of universals and particulars that led, inevitably, to the epistemological position of Descartes when he stated that he knew the nature of the wax by his visual sense, contrasting this with the recognition of humans beings whom he

1.PR p50, 2.PR p190, 3.PR p60, 4.PR Pref. xiii.

recognized by an intuition and his faculty of judgment.[1] In this analysis, according to Whitehead, Descartes has understood the nature of a person in terms of universals, for he had no perception of a particular actual entity, his conclusion being reached by a judgment. His judgment was based upon nothing more than inference, with only the slightest trace of probability.[2] In the other case the wax is a particular, therefore in Cartesian philosophy, a substance. According to Whitehead, it is largely as a result of Descartes confining his theory of substance within the traditional parameters of confused understanding of the nature of these terms, particular and universal, that his conception of the nature of substance was in error.

According to the philosophy of Organism any disconnection of natural entities from their environment as a completion of their totality in the fact of nature, is merely an abstraction. Natural entities are not part of a substratum in which factors of nature exist but are in themselves factors of nature, open to thought. What has happened in the case made by Descartes is that a problem of the mind involving its interpretation of sense-perception of reasoned knowledge concerning nature, has been transformed into a fundamental question concerning knowledge of the character of the whole of nature itself. As a result, matter emerges as the metaphysical substratum of its own properties and the history of nature is interpreted as the history of matter.[3]

For Whitehead the implications of the acceptance of such a presupposition are extremely important. One of these is that time and space become attributes of substance, which clearly they are not. Entities of a spatio-temporal nature can be expressed without reference to matter. Thus, the theory of substance can be seen as a confusion and a muddle. Substance is a word used widely and extensively for many different relationships which may not have much in common other than their use in this connection. Matter, according to science, exists in time and space, and this becomes part of the muddle, for it subsequently leads to an unwillingness to remove spatial and temporal characteristics from 'individual entities'. The result of our consideration of individual entities first and foremost

1. PR p48, 2. PR p49, 3. CN p16.

from their situation as within space and time is that we miss the true nature of their basic characteristics. Thus, according to Whitehead, the origin of the doctrine of matter can be seen as the outcome of an uncritical acceptance of space and time as external conditions for natural existence.[1]

The conclusion derived from Aristotle's original doctrine of matter, that time and space are external conditions for existence, becomes a major difficulty for any explanation of nature for it implies that it is substance which is in space. But according to Whitehead, it is not substance which is in space but attributes such as colour, smells and sounds. He insists that even if we were to admit that substance and matter were the same, it would still be wrong to describe substance as in space, because space is used to express relations between substances. Space appears to have nothing to do with substances, only their attributes, as our experience of nature appears to suggest. On that basis, we ought to be prevented from finding any analogy between the relations of substances and our experience, which clearly we do find. Thus, the best argument that could be made in defence of the Aristotelian doctrine is that there are relations between attributes of substances. But Whitehead believed that it would be fraudulent to slip substance into space on the basis that space expresses relations between substances. On the face of it, space has nothing to do with substances, only with their attributes.[2]

Whitehead explains that even if we mistakenly choose to interpret our sense-perception of nature as sense-awareness of attributes of substances, what we have also then accepted is the impossibility of discovering any equivalent relationship between substances, because they are then ruled out by definition. This in turn implies that, regarding the earlier description of substance as matter in space, substance would have little connection with the space we experience in our perception of nature. In Whitehead's own words:

> What I am essentially protesting against is the bifurcation of nature into two systems of reality, which in so far as they are real, are real in different senses. One reality would be the entities such as electrons which are the study of speculative physics. This would be the reality which is there for knowledge; although on this theory it is never known. For

1. CN p20, 2. CN p21.

what is known is the other sort of reality which is the byplay of the mind. Thus there would be two natures, one is the conjecture and the other is the dream."[1]

According to T. E. Burke, the bifurcation of nature has a long history and it appears in many forms.[2] It is from the 17th Century that the form inherent in modern science became dominant, with its contrast between the way nature appears to us and what makes it appear as it does. This may be described in terms of the apparent and the causal. Bifurcation: "...may well seem to be inevitable once we cease to be content simply to accept the world as we find it and start to ask for reasons. Are we not constrained to accept that there must be more to it than meets the senses?"[3] But its acceptance has paradoxical implications, an example of which is the status of colour, sound and scent, as being mind dependent. This suggests that the perceiving mind is not simply reflecting the external world but is embellishing it with its own creativity. Is it not the case that taking seemingly rational and logical steps we have arrived at an absurdity.[4]

Adoption of the theory of the bifurcation of nature inevitably forces us to make a choice between our sense experience and the explanation of that experience, for it implies that what we perceive in nature is apparent nature. This issue is brought into focus with the advance of technology and the use of such instruments as microscopes and telescopes, for in these cases observation is mediated by instruments. Can we justify acceptance of the theory and at the same time, the doctrine of the empiricist that all our knowledge is founded upon sense perception? To do so would be to hold two opposing views on which to build our certainties.[5] However, to be presented with the alternative which is a mind dependent world, can only add to our scepticism. Science is in fact sawing off the branch upon which it sits, for it leads to the rejection of the scientific theories of causal nature, reducing them to little more than 'useful models' or 'teaching aids'. The unseen particles

1.CN p30,
2.T.E.Burke, The Philosophy of Whitehead, Greenwich Exchange, London, p24.
3.T.E.Burke, The Philosophy of Whitehead, Greenwich Exchange, London, p25.
4.T.E.Burke, The Philosophy of Whitehead, Greenwich Exchange, London, p25.
5.T.E.Burke, The Philosophy of Whitehead, Greenwich Exchange, London, p26.

of the sub-atomic are reduced to postulates, the need for which may be nothing more than transitory.[1]

Whitehead regarded the main influence on the general concepts of philosophy to modern times as being derived from the philosophy of Descartes and that the weakness of his doctrine could be summed up in the Cartesian view of the individual as one receiving experience. His conclusion that the centre of all knowledge is the 'I' of self is fundamental to his ontological argument. The 'I' receiving experience is a mentality but it is separated from the objective fact which it perceives. This reduces perceiving to nothing more than the activity of the mind, even in consideration of light, sound and heat. Yet, as a result of the presentation to itself of sense and thought, the 'I' is conscious of its own existence. Thus it is conscious of itself as a unit entity of what is perceived. Descartes met this challenge by resorting to the possibility of error in sense experience.[2] The mind was separated from objective fact by the soul which was explicable from within itself. In short, Descartes takes his stand only on the evidence of his own mind, and science has followed this objectivism ever since, where nature is conceived of for itself with its own separated autonomy.[3] The trend that he set has been followed by almost all, with the clear exceptions of Spinoza and Leibniz.[4] Such a doctrine is a major shift from the Greek and medieval world which conceived nature as something of itself, with its own material reaction.

The positive outcome, according to Whitehead, is that it is in spite of Cartesian philosophy that the objective and material world lives on in science. He believed that in general, by the end of the 17th Century it can be said that science had taken over spatial material as its its domain, located in space and time, with laws relating to its locomotion, and philosophy took charge of the subjective world of the senses and bodily feeling, these being the content of the cogitations of the individual mind. Both these worlds were part of the general flux of things in time which was measured by the mind of the individual.

1.T.E.Burke, The Philosophy of Whitehead, Greenwich Exchange, London, p27.
2.SMW p174, 3. SMW p175. 4. SMW p177,

The great weakness of this doctrine is that experience of the world is reduced to the termini of contemplation of the mind. Colours, sounds and smells become the 'furniture' of the mind, thereby confining the mind to its own private world. Because this conclusion became the starting premise for the philosophies of Locke, Berkeley, Hume and Kant, the question of how knowledge of the world is to be obtained became a question of the first magnitude.[1]

The result, according to Whitehead, is that the ideas introduced into philosophy by Descartes cannot be separated from the new ideas which developed in modern science. In particular, the premise that body and mind are different substances by nature and are independent of each other. This is based on Aristotelian deduction and is a confusion which has had unfortunate results. The value which was placed on a thing by an individual has, through a transitional process, led to things being regarded as possessing an 'independent substantial existence' of their own, with no reference to their environment being necessary for their description and explanation. This new assumption about substantial things is quite different from their original role.[2]

The effect of this assumption regarding substantial things, developed as a corollary to the work of Descartes rather than as a consciously reasoned argument. Whitehead regards Descartes as having emphasised the distinction between his own experience of the world, arrived at through his own consciousness, and the world itself, thus creating a form of duality. By consideration of what value there was in the individual world of the self, he began to transfer the values of the world to this new world of the self and its existence and its attributes developed as independent substance. But the independent bodily substances lost their value altogether as they were removed from their origins. This resulted in a subsequent degeneration to a valueless mechanism, though still retaining the possibility of existence as the result of an external creator.[3] In this we have the final contrast between a philosophy of substance and the philosophy of Organism which reverts the whole process by saying that: "...thought is part of the creation of the thinker" who has

1. SMW p181. 2.SMW p182, 3. SMW p242.

become the final end in the process.[1]

Whitehead accepted that a faith in enduring substances with enduring qualities, which may be essential or accidental, could prove to be a useful description of the world for general purposes of life, but to use it for the production of a fundamental statement of nature has never proved adequate. The belief in its ability to act as a foundation in this role came by error, but is now so heavily embedded in language, logic and metaphysics that it is almost impossible to eradicate. It is not the use of the word 'substance' itself which is in error, but its use in connection with an entity which is characterised by essential qualities while remaining a distinct single entity. This is in spite of accidental changes it experiences in relations and quality. The contrary doctrine of the philosophy of organism is that an actual entity never changes, though it is itself the result of what can be ascribed to it, derived from both quality and relationship. Thus the alternatives are clear, a monistic universe where change is an illusion or: "...a pluralistic universe in which 'change' means the diversities among the actual entities which belong to some one society of a definite type."[2]

Thus, in these first two sections, we have observed a rejection by Whitehead of some of the fundamental concepts underlying scientific thinking and the philosophy of science, including simple location, scientific materialism and the use of induction as scientific method. Ivor LeClerc states that Whitehead had recognised an urgent need to reconsider the place of matter, space and time in the context of the new thinking, as a result of the breakdown of faith in the Newtonian cosmology. There was sufficient evidence to convince him during the 1890s that new scientific theories were already leading to a recognition of the inadequacy of Newtonian Physics as a basis for cosmological theories.[3]

Having accepted all that this rejection entailed, the question arose as to what exactly there is at the base of nature. The answer to this question, according to Whitehead, was initially 'events',[4] but later this becomes 'entities'. It is on this assessment that LeClerk concludes

1.PR p151. 2.PR p79,
3.Ivor LeClerc, Whitehead's Metaphysics, An Introductory Exposition, George Allen & Unwin, Ltd. 1958, p9. 4. PNK p4.

that there is no doubt that Whitehead's main aim became a search for the more specific aspects and details of nature which could lead to the expression of fundamental and general notions and principles of nature. Thus, the philosophy of science for Whitehead became what this investigation reveals.[1]

LeClerc believes, at the very least, that this task would involve the necessity of producing a new formulation of concepts which related to the ultimate facts of physical science, and specifically of modern physical science. These would be: "...consistent with experience and free from the inner contradictions of the old theory".[2] It was in fact in embarking upon this new project that LeClerk saw Whitehead as becoming involved in subjects normally regarded as outside the scope of science, and although he may only have expected to alter his procedures in order to deal with what were essentially the same problems, he was led to a clear involvement with, and use of, metaphysics.

Summary

In this section we have recognised the importance Whitehead attributes to induction as being the basis of modern scientific method, and his insistence that it must be qualified by a recognition of its limitations. It is not the instrument for devising universal laws of physical nature, for example. We considered some of the reasons for this caveat, explained in the philosophy of organism, resulting from an analysis of the present occasion. Our knowledge is simply too limited to justify the inductive step.
We noted Whitehead's approval of Hume's criticism of induction, which provided him through the philosophy of organism, with an opportunity of emphasising the importance of the relationship of the immediate occasion with its environment, and the relation of both of these with the environment of occasions in the future. Similarly, with the response of Karl Popper to the challenge of induction, proposing a recognition of the subjectivity of the

1. LeClerk bases his affirmations concerning Whitehead's main aim upon SMW p175 and CN p28.
2. Ivor LeClerc, Whitehead's Metaphysics, An Introductory Exposition, George Allen & Unwin, Ltd. 1958, p11.

process, Whitehead could draw attention to the inadequacy of empirical evidence alone as the basis for progress in science. The inclusion of metaphysics within the interpretation of the evidence was recognised as an essential element within inductive reasoning. Faith in the inductive method in the philosophy of organism, is based upon the continuance of a the future environment of the dominant electro-magnetic society of which we are a part. The laws appertaining to that particular society can be established, and they will continue as long as the society endures. Consideration of the background environment, a change in which could cause the collapse of the electro-magnetic society, led to the introduction of Whitehead's epochal theory.

In the second part we commenced by examining the way in which Cartesian Substance Philosophy underpins induction. This is achieved by the suppression of the premise that the successful operation of inductive arguments rely upon knowledge of the nature and environment of the occasion in question being known. Induction then becomes a question of statistical probability. In deriving his concept of substance from Aristotle, Descartes has inherited the notion that substance requires no other thing than itself in order to exist. Descartes' conclusion of a duality of the substances of spirit and matter, each of which is unique, led to a recognition of the difficulties this presents to the interpretation of time and space, as they become attributes of substance and the external conditions of existence. Whitehead recognised the continued influence of Cartesian Substance Philosophy in our contemporary philosophy, in particular in connection with the so-called 'mind / body' problem in which mind and body represent the two different substances of spirit and matter. Whitehead describes this as the main contrast between the two philosophies of Cartesianism and the philosophy of organism. The latter attempts to justify a pluralistic universe where change means diversity of entities of a particular society, with its own particular characteristics.

3. The Relationship between Science and Philosophy according to Whitehead

This section will be divided into three parts. The first will be an outline of Whitehead's description of the main developments between science and the philosophy of science, from the time of the Greeks to the first part of the 20th Century. The second will be a consideration of the contribution of Whitehead to the debate on the current relationship between science and philosophy, while the third will be an assessment of various scholars on Whitehead's place in that philosophical scheme.

Whitehead's analysis of the development of science and the philosophy of science

Whitehead's account of the development of the relations between science and the philosophy of science, from the classical Greek period onwards, up until the Mid 20th Century, suggests that it was along the following lines.

On several occasions Whitehead expresses admiration and gratitude for the vision, inspiration, dedication, and success of the work of the geniuses in the field of science in the period of the 'scientific revolution' and the subsequent two centuries. The field of science included both 'scientists' and 'philosophers', involved in the interpretation and utilisation of the new discoveries of their age. For example, Whitehead referred to the geniuses of seventeenth century as those providing such an accumulation of ideas that people of subsequent centuries have benefited from their endeavours.[1] His comment regarding the eighteenth century is no less enthusiastic; "Les Philosophes were not philosophers. They were men of genius, clear-headed and acute, who applied the seventeenth century group of abstractions to the analysis of the unbounded universe."[2]

As we observed at the outset, Whitehead's analysis of the development of science and philosophy began with the Greeks. The characteristic of these early geniuses in the field of science was that they were interested in producing questions and theories concerning physical nature.[3] In this respect, though their questions represented thought of a logical, lucid and philosophical character, their interest was mainly in generalities.[4]

1.SMW p49, 2.SMW p73/74, 3. SMW p6, 4. SMW p9.

It was Plato who recognised that considering ideas alone raises the question of compatibility. Either ideas are compatible with one another or they are not, hence the key to coherent thought is the determination of what notions are compatible. Thus, from the establishment of compatibility we can gain an understanding of the functioning of the world as the place for the realisation of these ideas. From this conclusion Plato directed his attention to the creative advance of the world. Ideas in isolation are static and lifeless, but applied to the creative advance with intelligence, these static, lifeless ideas can be transformed into what Plato termed the 'Psyche'.[1] The idea of knowledge abstracted from the world was alien to Plato's thought. Whitehead expresses agreement with Plato regarding the compatibility of notions and ideas as being the key to coherent thought, but appears to disagree with Plato in his rejection of the possibility of verbally expressing a final system.[2]

According to Whitehead, it was mainly as a result of the work of Plato and Aristotle, that the link between science and philosophy was achieved[3] with for example, the Greek doctrine of 'harmony' and 'aesthetics' being reflected in mathematics. Plato's conclusion, that the way to understand the natural world was through the study of mathematics, involved notions concerning the fundamental nature of things.[4] It was such questioning into the nature of things that raised humans above the of the level of 'animal life'. It was a kind of curiosity, shown for example in the ability of Aristotle to formulate the law that: "... there is a tendency for material bodies to seek the centre of the Earth."[5] In this observation we see curiosity in operation. Whitehead described the first steps as having been taken in science and philosophy when it was understood that: "...every routine exemplifies a principle which is capable of statement in abstraction from its particular exemplifications".[6] Aristotle's attempt to formulate a law of gravity illustrates the drive of curiosity, which Whitehead described as the desire to state principles in their abstract

1. Whitehead points out that 'psyche' is not intended to convey the notion of soul as developed in Christianity after two thousand years of accretions. By 'psyche' Plato means a basic spirituality which actively grasps ideas and thereby impartially conditions the whole process of the universe. AI p147.
2.AI p147/8, 3.AI p143, 4. AI p149, 5.AI p140, 6.AI p141.

form. This law of gravity may be recognised as a reduction of this curiosity to generality and impartiality in this abstract process. This process is in the analysis of the facts of physical nature.[1]

Plato, having already emphasised the importance of classification, made a further contribution to our understanding of the connections between science and philosophy when he emphasised the need within science to observe, deduce and then classify according to function. According to Whitehead, this constituted a transition from intuition to scientific method:[2] "Thus, with Plato and Aristotle, a new epoch commences. Science acquires the cleansing of logical and mathematical lucidity. Aristotle established the importance of scientific classification into species and genera; Plato divined the future scope of applied mathematics."[3] It was from this period that the hallmark of modern European science was created.[4]

At this early stage there was no differentiation between science and philosophy.[5] Whitehead described science as an 'off-shoot of philosophy'. They were compatible, complementary and sharing a common origin.[6] This 'Greek' attitude to science continued in Europe during the Middle Ages, when science began to build upon the notions it had inherited from the Greeks. Thus, science was still dominated by orderly thought and rationalism.[7] Many of these assumptions and principles were carried forward from the Greeks into the medieval period. According to Whitehead the greatest achievement of the medievalists was the establishment of the belief that: "...every detailed occurrence can be correlated with its antecedents in a perfectly definite manner, exemplifying general principles".[8]

According to Whitehead, it was this faith which has been the motivation and hope of scientists in their research. He described this faith as a notion which was based upon a combination of both Greek thought and direct observation of what is around us, revealing itself as a: "...general common sense notion of the universe".[9] It was beginning to form

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1.AI p142, 2.AI p147, 3.AI p149, 4.SMW p144, 5. SMW p141, 6.SMW p19, 7.SMW p14, 8. SMW p173. 9.SMW p15.

among progressive thinkers in the early part of the 16th Century. The role of the notion was to supply the terms on which answers to all other questions could be based. The other questions related to the laws of locomotion, the meaning of life, mentality and the inter-relations of matter with these. This common sense general notion of the universe was presupposed by the leading thinkers of the 16th and 17th Centuries.[1] Thus we can trace the problems between modern philosophy and science to the time when the attitude towards the Greek rationalistic understanding of the world was largely abandoned in favour of a new individualism based, in philosophy, on the notions of Descartes. As a result: "Modern philosophy is tinged with subjectivism, as against the objective attitudes of the ancients."[2] Whitehead was also convinced that the new understanding of science and its role differed so greatly from the old rationalist position of the Greeks, that any possibility of harmonising the ultimate concepts of science with ideas emanating from a wider, and thereby a more concrete, scheme based upon the whole of reality, had been destroyed. Resistance to such a scheme by the 'moderns' - those rejecting the rationalism of the old order - came from their new attitude to material, space, time and certain laws which related to the transition of material configurations, all of which they regarded as ultimate stubborn facts and therefore sacrosanct.[3]

Until the 17th Century the histories of philosophy and science had proceeded on a curiously parallel course.[4] The schism developed as a result of the concentration of the new science upon materialistic nature leaving philosophy or epistemology to concentrate on the cogitations of the mind.[5] According to Whitehead, the dichotomy between science and philosophy which resulted from the scientific revolution of the 17th Century should be recognised as more of a rejection, or repudiation, of philosophy by science, rather than a divergence of agreement. It was cemented by the sheer success of the revolution, which made the previous role of philosophy appear as superfluous.[6] The adoption of the new successful doctrines led to the rejection of the rationalism on which philosophy relies. Materialism was the assumption that underpinned the other systems of the epoch, and it

1. SMW p176, 2.SMW 173, 3.SMW p175, 4. SMW p177, 5 SMW p180, 6.SMW p51,

was also that which limited the type and number of philosophical systems which were possible.[1] The materialistic creed justified itself so that 'physics took no more interest in philosophy'.[2]

The establishment of a division of territory between science and philosophy proved more difficult than expected. The static nature of the presumptions upon which the whole of science rested were revealed.[3] There was an artificial division separating the objective world of science from the subjective world of philosophy, where the latter concentrated its attention upon the subjective content of the mind of the individual. Although both shared in the general flux of time, the method of measurement reduced time to the cogitations of the observer's mind. Based upon Cartesian philosophy of the subject-object conformation of experience, the mind seemed to be trapped in a world of its own. In this theory the entities which were the termini of reflection simply became the furniture of the individual mind. The 17th Century dualism of mind and body cut straight across the unity of nature.[4]

According to Whitehead, the aspects of failure of 18th Century science centre mainly around its deficiency in not providing any elements of explanation for the psychological experience of humanity. It had inherited an efficient but narrow scheme of scientific concepts, suitable for the development of engineering and technological developments, but there was no trace or hint of any concept of a unity or whole, in which these other developments inhere. It other words, the narrow scheme was not suitable for the foundation of a cosmology.[5]

Whitehead believed that it was from such mistaken doctrines of 17th and 18th Centuries that the more recent erroneous philosophical doctrines have developed, for example, doctrines based on scientific materialism.[6] Such doctrines have led us to a distorted account of human experience.[7] Various doctrines of sense-experience reached a final form in the 18th Century through Hume and his 'Treatise'. In this doctrine the factors of

1.SMW p61, 2.SMW 63, 3.SMW p180, 4. SMW p181, 5. SMW p92/3, 6.MT p157, 7.MT p158.

experience such as colour, sound and the like, have become the primary concern. Other factors of experience associated with feeling and emotion, such as love, hate, fear, intention, aspiration and recollection, have been reduced in significance, as derivatives of the former. It is believed in this doctrine that apart from sensa, this second group, related to the emotions, would not exist.[1] In short: "Human nature has been described in terms of its vivid accidents, and not of its existential essence."[2] That is to say, all creation was interpreted in terms of the attributes of objects and it was from these attributes, as the qualities of objects that a doctrine had to be formed to explain human beings.

Whitehead recognised a narrowing of vision over the whole period, for as science grew so also he believes, did minds shrink. The specialisations required by a civilised society were manifest in universities where departments were set against other departments and university against university. The 19th Century was a period of great achievement but it failed to produce people of a sufficient sensitivity to understand the nature of the century's existence.[3] It was a time of even greater narrowness of mind and lack of vision than any previous century. Even though its scholars possessed greater knowledge than their predecessors, its own philosophers had lost any sense of the variety of alternatives.[4] But even in the 19th Century there were the first indications that the scientific materialism which was underlying all the scientific activity and most of the philosophical notions was under threat.[5] Philosophers are rationalists, whose job it is to get behind the stubborn and irreducible facts which they wish to explain. Their explanation must be based upon accepted universal principles. Cross referencing between various detail will be part of the general flux of things.[6] This presents a much wider brief than that offered by the modern philosophers of science whose arbitrariness and narrow mindedness has become an obstacle to the necessary co-operation between science and philosophy.

Thus, Whitehead's analysis revealed i) that natural science has abandoned every feature of the original common-sense notion for the interpretation of the universe, and ii) that this common sense notion still survives and dominates in the work-a-day life of humanity.

1. MT p152, 2.MT p158, 3.MT p61, 4.MT p62. 5. MT p199/200, 6.SMW 176.

However, there has been no reconciliation between common sense and the new science for reconciliation is not a characteristic of science.[1] Each science deals only with a fragment of the evidence, producing its theories based upon its understanding of that fragment. Such a procedure is necessary because of the limitations of human ability, but as a result, the dangers of such a procedure should always be kept in mind.[2]

Whitehead did welcome the growth of the biological sciences, which took place from the 18th Century onwards,[3] for it was, he believed, the inclusion of the notions of biology which assisted in the process of breaking down the narrow limits of the physical scientists. The growth was to lead to the establishment of a greater breadth in science, which was essential for the foundation of the development of an organological philosophy of nature.[4] According to Whitehead, biology meant the study of living organisms but the introduction of any new ideas concerning any issue, such as those of Lagrange and Maupertuis who wished to discover something more fundamental and general than Newton's laws of motion, would be welcomed. Such issues might succeed in revealing something which would challenge the established scheme of abstractions and jolt science out of its complacency.[5] In spite of this, even by the 20th Century there seemed little evidence that any link had been established between idealists schools of philosophy with the organic facts of nature: "My point is that a further stage of provisional realism in which the scientific scheme is recast, and founded upon the ultimate concept of organism."[6] According to Whitehead the reason why the scientific world has remained contented with its abstractions is because they work. But if the field of thought is too narrow it indicates that we require a wider field which is a more concrete analysis which will bring us closer to our 'intuitive experience'. Such an analysis, he believed, requires a place for both matter and spirit, for so many of our so called 'physical experiences' can be interpreted in terms of 'intuitive experience'.[7]

1.MT p177, 2. MT p178, 3. SMW p78/9, 4.PR p309, 5.SMW p76-79, 6.SMWp80, 7.SMW p83.

The progress of biology, to some extent, went in parallel with that of physics during the 19th Century. For example, the introduction of the cell theory in biology was taking place at the same time as the atomic theory was being introduced into physics and chemistry. Whitehead regarded the work of Louis Pasteur on the cell theory as in many ways even more revolutionary than that of Dalton on the atom, because it was as a result of the work of Pasteur that the notion of organism was introduced into the realm of minute beings. By demonstrating that an organism could function at an infinitesimally small magnitude, Pasteur helped to challenge further, the belief already under threat from Mendeleev's 'Periodic Law', that the notion of the physical atom as the ultimate entity was inadequate.[1]

However, according to Whitehead, science was to a large extent, still interpreting its data in terms of 17th Century scientific materialism.[2] The growth and development of Biology went hand in hand with an appeal to a mechanism based upon materialism, as a result of the domination of laws formulated by physical science. According to Whitehead, these physical laws based upon the supposed behavior of atoms were not at the time mutually consistent. Confusion arose because biology was not appealing to a set of well attested laws, for no such set of laws existed.[3] However, an initial appeal to mechanism from within biology, was an appeal to a widely held group of concepts which expressed natural phenomena. By the 20th Century that system of concepts had been undermined: "Science is taking on a new aspect which is neither purely physical, nor purely biological. It is becoming the study of organisms. Biology is the study of larger organisms; whereas physics is the study of the smaller organisms."[4]

Thus, the rationale for Whitehead's appeal to the development and rise to prominence of biology as an enabling step towards the establishment of an organological philosophy can be appreciated. Evidence from the historical development of the biology suggests an increased recognition of the need for a wider field of concepts to be included in the construction of philosophical

1.SMWp125, 2.SMWp83, 3.SMW p128/9, 4.SMW p129.

cosmologies. Whitehead's case finds support in an analysis by Ernst Mayr. According to Mayr, all too often it is assumed that what is true for physics is true for science as a whole,[1] the differences between biology and physics being ignored.[2]

Into this situation came the new notions and knowledge of the twentieth century, epitomised by the philosophical contribution of William James. In works such as 'Does Consciousness Exist', he represented the philosophical challenge of the commencement of the new century to the scientific notions of the 17th Century, as well as presenting a new philosophical approach. It was left to William James to inaugurate a new age in philosophy in which mind was put back into nature through the development of psychology.[3] James is of such importance to Whitehead because his work denies exactly what Descartes asserts in his 'Meditations'.[4] James introduced a new decisive change of tone, moving from the study of physiology to psychology.[5] The effect of the abstraction of dynamics, physics and chemistry had been to focus control of the drive and direction of science away from the common sense values of the 16th Century scientific scheme, towards a concept of nature derived from the speculative physics observed at the early 20th century, where all reference to life had been suppressed.[6] However, in the 20th Century the view is that process, activity and change are the new matters of fact, all of which include transition within their essence. In the language of the philosophy of organism, all realisation includes the implication of involvement in the creative advance.[7] Furthermore,

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1. Ernst Mayr, The Growth of Biological Thought, Diversity, Evolution. Inheritance, Harvard University Press, Cambridge Massachusetts, London England, 1982, p32.
Mayr believes it is sometimes necessary to stress the pluralities of science in order to compensate for the neglect of biology and other sciences.33 He notes the difficulties experienced by Kant with the publication of his 'Kritik der Uteilskraft'(1790) in which he argued that: "...biology is different from the physical sciences and that living organisms are different from inanimate objects." P35.
2.Ernst Mayr, The Growth of Biological Thought, Diversity, Evolution. Inheritance, Harvard University Press, Cambridge Massachusetts, London England, 1982, p33.
3. SMW pp177-183, 4.SMW 179, 5. SMW p182, 6. MT p198, 7. MT p200

according to Whitehead, it is the insistence of modern philosophers of science that rational thought is futile beyond some ultimate mechanism, that has pushed philosophy into the sidelines with the loss of its role as critic of partialities. Worst of all, philosophy has retreated into a subjectivist philosophy of mind as a result of losing its legitimate role of the analysis of matter.[1]

Rationalism, the Philosophical scheme and Mathematics.

Whitehead attributes the adoption by science of its anti-rational approach to its inheritance of a bias from its origins, which then became detrimental to it. In so far as it still rejects rationalism and confines itself to a narrow abstraction of what is necessary to formulate successful scientific theory, science has retained this inheritance of bias.[2] Whitehead regards it is this anti-rationalism, derived from an abhorrence of the rationalism and intellectualism of Greek and Medieval philosophy, that is totally misplaced. For example, according to Whitehead, Art has an equal capacity with science in any quest for the establishment of truth. It can reveal in a flash, intimate and absolute truth regarding the nature of things. It is at least partly a result of this contribution to civilisation that mentality can attempt to keep up with physical development.[3] What the anti rationalism of modern philosophy of science has achieved is to halt any attempt to harmonise the ultimate concepts of science with a wider survey of other aspects of concrete reality. It simply concentrates upon the 'physical' aspects of creation such as: "The material, the space, the time, the various laws concerning the transition of material configurations,..."[4]

Science makes itself ineffective and insular by confining itself only to the understanding of the external world, as a result of premises devised consequentially to the introduction of a new scientific method. According to Whitehead, this ineffectiveness can be reversed only by the reintroduction of rationalism and the establishment of a close relationship between science, philosophy and religion.[5] There should be a fusion of science, religion and philosophy into one rational scheme. Religion would provide an emphasise in philosophy

1.MT p200, 2.SMW p12, 3.AI p272, 4. SMW p175. 5.PR p15.

towards the human emotions and purposes which are so essential in art forms, and which emanate from individual existences in particular societies at different times in relation to their own particular antecedents. Philosophy would serve to modify religion through its rationality, for religion is part of the data of philosophy and is included in its own scheme.[1] Each has its own particular role to play, though methods may be different. The role of modern science is to investigate particular species. The generic notions under which the subject matter arranges itself is for the investigation of metaphysics. Thus, without such a combination science has been defective in its ability to shed light on scientific principles.[2]

Philosophy offers a total rational exposition of a sensitive individual experience, of a particular consciousness. What philosophy must not do is to attempt some brilliant exercise of explaining facts away, for it is the task of particular sciences to investigate the content of their subject. For philosophy to encroach upon the territory of another discipline in that way would be inappropriate. Speculative boldness must be matched by complete humility in the face of logic and fact. Its true appeal is to the general consciousness which we call experience, manifest in the social expression of many epochs of rational thought, but just as in science one aberrant piece of information does not alter a theory, so also in philosophy the more general the rationalist scheme can be, the greater will be its final appeal: "The useful function of Philosophy is to promote the most general systematisation of civilised thought."[3]

However, it is essential that philosophy is not conceived as one of a group of sciences, having its own separate little scheme of things and able to operate in isolation from other sciences, demanding its own complete and entire attention in order to bring itself to completion. The role of the philosophy of science is to discover a unifying concept which will bring all the sciences together, by confronting science with the concrete fact of experience. It is this which led Whitehead to describe philosophy as the 'critic of abstractions'.[1] By 'abstractions' Whitehead meant that science has displayed the tendency to study particular topics in isolation and draw conclusions from these observations

1.PR p16. 2.PR p116, 3.PR p17.

without recourse to environment and other topics. Even Physics itself is an abstraction, if studied in isolation as though it were the whole of science.[2] Such abstractions are things which must be recognised for what they are, in order to be able to establish their relations with other sciences and science as a whole.[3]

The endeavour to make possible the unification between science, philosophy of science and religion, which Whitehead envisaged to be necessary, is resisted by the notion that science is different from other areas of knowledge because in science we are dealing in certainties. This misapprehension is clearly encapsulated by A. F. Chalmers.

> "In modern times, science is highly esteemed. Apparently it is a widely held belief that there is something special about science and its methods. The naming of some claim or line of reasoning or piece of research 'scientific' is done in a way that is intended to imply some kind of merit or special kind of reliability."[4]

In a quest to establish a firm foundation for science it is necessary to question whether we can really commence from the premises of certainty which has been claimed for science. Whitehead wished to cast doubt upon this certainty. Even in mathematics, for example, where it is easier to establish falsehood in cases where there is a contradiction in results, statements based upon 'ultimate logical principle' are still encompassed by as yet insurmountable difficulties. As a result there can be no legitimacy in attempting to prop up physical science, as experienced in induction and probability for example, by the use of mathematics.[5]

According to Whitehead, it has been a common error to argue that because we believe in the certainty of mathematics itself, we can apply mathematics to the geometry of the physical universe and thus be sure that we have demonstrated the truth of our hypothesis. The mistake occurs because we forget that mathematics operates in the sphere of

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1.SMW p108, 2.SMW p190, 3.SMW p108.
4 A F Chalmers, What is this Thing called Science?, Open University Press 1982, pxv.
5PR p8.

complete abstraction until it is applied to specific examples. We should not delude ourselves that because there is a mathematics which fits a theory it proves the theory to be correct.[1]

> "The certainty of mathematics depends upon its complete abstract generality. But we can have no a priori certainty that we are right in believing that the observed entities in the concrete universe form a particular instance of what falls under our general reasoning."[2]

The effect this has had on the construction of our cosmologies has been considerable. Whitehead points to the classic example of the cosmological model as constructed by Ptolemy, which was only rectified by the struggles of such mathematicians and astronomers as Copernicus, Galileo and Kepler. Yet there is a suitable mathematical justification for the Ptolemaic system.[3] A second example, referred to by Whitehead, is that of relating an explanation of the quantum theory to that of classical physics, where the main question was whether mathematics could provide an answer to the location of the electron.[4] In this second example the difficulty which remains for the philosopher, even if mathematics is able to offer a solution to the physical theory, is in accounting for the discontinuity of existence at the sub-atomic level. The discontinuity of the existence of the electron, as described in classical physics, still leaves the philosopher with the problem of relating that world to the one of the continuity of our daily experience. For Whitehead this requires nothing less than a revision of our concepts of the nature of material existence[5] and a new vibratory theory of matter which can be applied to the quantum theory. But even to construct such a theory is only to be in a position regarding the nature of the sub-atomic, as Pythagoras was when he realised the importance of abstractions in relation to frequencies. Thus Pythagoras offered his solution to the problem by describing the characteristics of periodicity as an answer to the description of musical notes.[6]

1.SMW p27, 2.SMW p28. 3. SMW p164, 4.SMW p45.
Prof. Jean Seidengart points to a further complication in the conflict between those advocating a Geocentric system of explanation for planetary movement and those proposing a Helio-centric system, by demonstrating that both sides appealed to the same mathematics of geometrical parallax for evidence in their case.
Jean Seidengart, The Problem of Infinity in Copernicus' Cosmology, International Association of Cosmos and Philosophy, Sixth Annual Congress, held at the 'P. A. Florensky Foundation, St. Petersberg, 3rd - 10th August 1994. 5.SMW p45, 6.SMW p48.

The rejection by Whitehead of the use of mathematics alone, as a means of formulating an adequate cosmology, draws attention to the significant role mathematics did have in all the phases of his own development. According to Plamondon, he was concerned with the fundamentals of geometry throughout,[1] and in the first phase of his academic career the was with the relationship between space and those eternal things which constitute the stuff' of space. By eternal things or 'ultimate existents' he means the conception of all the features of the temporal world in so far as that world is participating in the eternal through the involvement of eternal objects in the data of actual entities.[2]These entities which are the ultimate existents, involve the concept of geometrical points and lines which are characteristics of the ultimate features.[3] It was during the second period or phase that he became convinced by the relational theory of space[3] which suggests that we should conceive space to be a: "...complex of relations between things."[4] According to Plamondon, this convinced Whitehead that a fuller investigation into the fundamentals of geometry would be required.[5]

Plamondon relates Whitehead's relational theory of space to the formulate of his doctrine of 'Extensive Connection' which in turn led into the method of extensive abstraction. According to Plamondon:

> "Whitehead illustrates the relation of extensive connection between two regions by a set of diagrams. These diagrams indicate that the two regions are extensively connected when they partially or wholly overlap or when they have contact at a single point or along parts of their boundaries."[6]

These diagrams were supported and explained by a series of definitions and assumptions.

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1 Ann L Plamondon, Whitehead's Organic Philosophy of Science, State University of New York Press, Albany, 1979, p9.
2 (A more detailed description on the nature of 'eternal Objects' is provided in Chapter 2 Section 6)
3 Ann L Plamondon, Whitehead's Organic Philosophy of Science, State University of New York Press, Albany, 1979, p12.
3. (See Chapter 2 Section 9 for a more detailed discussion on this doctrine) 4. PNK p5,
5. Ann L Plamondon, Whitehead's Organic Philosophy of Science, State University of New York Press, Albany, 1979, p13.
6. Ann L Plamondon, Whitehead's Organic Philosophy of Science, State University of New York Press, Albany, 1979, p21.

She points out that Whitehead's doctrine of the actual entity holds significance for the ontological status of mathematical entities, which thus involves the whole of the metaphysical scheme.[1] It is through a mathematical form that one of Whitehead's actual entities is introduced to another, for the associated actualisation is through a form they hold in common, which is a pattern, a structure as well as characteristics. The mathematical form is conceived as being an abstraction from all the qualities of pattern structure and characteristics.[2] As Whitehead puts it: "The extremity of abstraction from all qualitative elements, reduces pattern to a bare mathematical from."[3] These examples demonstrate the importance of the application of mathematics to the construction of the whole of Whitehead's philosophical scheme. His concern is that there should not be a missuse of mathematics in discussions of a cosmological nature.

According to Whitehead, the aim of philosophy is simply to disclose 'the fundamental evidence' which can reveal the true nature of things, i. e. how things are. All understanding is dependent upon this. The expression of any philosophy employs and relies upon this basic experience of nature. Experience is also the basis of all our presuppositions. It is through a structured philosophy that the totality of experience can be made coherent. Each detail can find its correct place while also revealing disparities and inconsistencies. In this way abstractions can find their place in the scheme of things.[4] Thus, philosophy is not concerned with 'proving' something for proof is concerned with abstractions. The goal of philosophy should be to reveal self-evident truths while at the same time recognising the near impossibility of the task, because of the limitations of human knowledge. According to Whitehead, only when 'proof' reveals self-evidence is it of any value. However, even though 'proof' may constitute a second choice procedure, it is still one possible route by which self-evidence can be achieved.[5]

The development of philosophical thought lies in the communication between civilised

1. Ann L Plamondon, Whitehead's Organic Philosophy of Science, State University of New York Press, Albany, 1979, p23.
2. Ann L Plamondon, Whitehead's Organic Philosophy of Science, State University of New York Press, Albany, 1979, p30. 3. AI p326, 4.MT p67, 5. MT p66.

communities which participate in the possession of a legality, morality, social structure, developed literature, science and realm of aesthetics.[1] Philosophy involves numerous types of expression, varieties of modes of existence each with its own characteristics, and the overlapping of aspects of things in its sources of information. According to Whitehead, it is extremely unfortunate that philosophy has concentrated so much on what he refers to as the 'manageable relationships', when the spiritual life of humanity is more concerned with landscape, poetry, foolish enterprises and irrational hopes and fears, than with the basic needs of humanity which keep humans alive.[2] Whitehead agreed with Henry Sidgwick when he said that any philosopher who omits any reference to bodies of judgement which make up the subject of ethics, cannot possibly fulfil the aim of philosophy, thus re-affirming the importance he attributed to both religion and morality, as well as to aesthetics, as contributing to an understanding of the philosophy of science.[3] It is futile to offer a scientific explanation of the world which does not take into account the daily requirements of the social and psychological needs of people's experience of life, for it misses something important in the scientific debate.[4]

However, experience, which is the basis of philosophy, is also the basis of all science, i.e. both science and philosophy ultimately appeal to the same base as their authority. The emphasis on experience applies in science even in the use of instruments, which rely for their information gathering capacity equally upon antecedent accuracy checks and upon environmental invariance, as do naked eye observations. Whitehead showed concern for the increasing trend since the 19th Century towards the use instruments in scientific research. This had led some to make a distinction between 'private' and 'public', in relation to the value of the observational statements. For Whitehead, percipient perception either with or without instruments involve presentational immediacy:

> "This appearance is always a perception in the mode of presentational immediacy. If such perception be in any sense 'private' in contradistinction to a correlative meaning for the term 'public', then the perceptions, on which scientific measurement depends, merely throw light upon the private psychology of the particular observer, and have no 'public' import,"[5]

1. MT p96/7, 2. SMW p176, 3.SMW p176, 4. SMW p96, 5.PR p329.

According to Whitehead, such descriptions are used as a shortcut to a simplicity of statement. Reference is being made to a 'public world' where such a concept is essential for expressing the status of science in relation to experience. But we have to make a decision between science as an important statement concerned with systematic theory, which correlates observations of a common world, or as a daydream of individual intelligence. It is not good philosophy to vacillate between the two.[1]

Philosophers also appear to be distracted by the evidence of individual sensations of particular senses which are 'obvious and trivial'. Whitehead suggested that this is the result of the continuation of the myth of an underlying reality. Philosophers should stop neglecting the evidence of the whole of nature, in which there is a need to establish the place of humanity.[2] The result of our philosophical method has led us to neglect our own intimate, vague, inner-most experiences; our own inner thoughts derived from our life experiences, which in reality are the foundation of our rationality: "It is the direct insight, vague as to detail and yet the basis of all rationality that has been denied by the prevalent epistemology of the preceding century."[3] We noted Whitehead's description of the drive which led Aristotle on to the formulation of his law of gravity as 'curiosity' and Plato's ability to make the transition from intuition to scientific method.[4] Whitehead used 'curiosity' to describe the power of the internal motivating force which has driven people onwards, where 'onwards' means towards the discrimination of facts of experience, in order to gain better understanding, separated from the safety of accepted habit and routine. According to Whitehead, it is the desire to state the principles in abstraction that drives them away from the safety of traditional practice. Curiosity involves what he describes as: "...a ruthless element which in the end disturbs."[5] However, the labours of Plato are an example of 'philosophic intuition' passing into scientific method. This represents an important distinction between 'curiosity' as the motivation for activity, and intuition as the way or method of proceeding.

1.PR p329, 2.MT p43, 3.MT p44. (4 See Side) 5. AI p141,

A H Johnson described Whitehead's use of the word intuition as wide ranging. For example, Whitehead describes the first human analysis of the actual world as 'that all things flow', as intuitions.[1] Here intuitions are vague and unsystematised. This may be compared with his description of his organic philosophy of the togetherness of concrescence and novelty, on introducing the categoreal scheme, when he describes intuitions as 'inescapable'. This 'inescapability' applies whether considered in termsof'high universals' or of the different components which participate in concrescence, for Whitehead makes it clear that the only justification for accepting togetherness is intuition.[2] This is to say that intuition is at the heart of the first and the deepest insights of which we are aware. Equally as important is that they are at the heart of the philosophy of organism as, according to Whitehead, we are justified in describing a philosophical system as an attempt to co-ordinate all such intuitions.[3] This marks out the extent to which intuition is involved in both science and philosophy.

Each special science has basic notions which are specialisations derived from the background of intuitions appertaining to the general thought of any particular epoch. The only way that they are articulated is through their use in science. It is through their development in philosophic and scientific schemes that the human spirit can develop its deeper intuitions. Thus the schemes gain their credibility from intuition and thought which would otherwise be lost to humanity for ever. According to Whitehead, failure to recognise this interweaving of intuitive thought and scientific schemes represents a serious misunderstanding in European thought which he names 'The Dogmatic Fallacy'.[4] However, since the time of the Greeks, ultimate insights of intuition have been dismissed as simply the interpretation of sense-impression. By analogy, there is as much sense in continuing to follow the evidence of particular sensations as the basis of our philosophical reasoning as there is in using a set of traffic lights to explain the whole of sociological theory. We should recognise that though intuition is vague, it is still the basis of all

1. PR p208, 2. PR p22.
3. A. H. Johnson, Whitehead's Theory of Reality, Dover Publications Inc., 1962.pp9-11.
4.AI p144.

rationality.[1] Whitehead makes a comparison of his own use of the word intuition with that of Bergson's stage of 'pure and instinctive intuition', when he describes the three stages of feeling in his own scheme.[2] This description confirms the distinction Whitehead makes between 'instinct' and 'intuition', but the meaning Whitehead intends is not always clear, in some places being vague and imprecise.[3]

A. H. Johnson suggests that Whitehead's use of the word intuition as described above and on other occasions,[4] refers to the non-sensuous aspect of perception in which the word intuition is closely associated with causal efficacy. Most interestingly, he links the word with Whitehead's description of non-sensuous perception, in some cases even regarding it as a substitute for it. Thus, genuine knowledge of a thing is knowledge of it via a process of knowledge as self evident. It is this which enables us to grasp the interconnectedness of things. Johnson notes the many types of category of intuition for which Whitehead caters, such as religious, moral or that of the good life. This is a different usage from the technical term 'intuitive judgement' which Whitehead refers to in examples in Process and Reality.[5]

According to Whitehead, descriptions offered for the word intuition have resulted in a usage which is corrupted and lacking in clarity. Adopting these established words and phrases when describing intuition may mask the true meaning of the intuition or intuitive statement. This is especially true in the subject - predicate form of expression. The loss of true meaning has occurred in such statements as 'the grass is green', for example, and 'the whale is big', because of reliance on a method of expression where much diversity of meaning is hidden by the simplicity of the statement.[6] The primitive form of the expression of our physical experiences is 'emotional', the highest state of which is the element of sympathy, which is feeling. A high degree of abstraction would result if the emotional content were to be removed from such a statement as 'the stone is grey'. The emotional content of the description is the presentational intuition.[7] Emotion in human experience is more than simply 'emotion', for it is modified into higher categories of

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1.MT p44, 2.PR p280, 3.PR p207.
4.AI p228 & MT p69 5. PR p271, 6. PR p13, 7. PR p163.

feeling by being interpreted, integrated and merged as part of the 'presentational intuition'.

However, according to Whitehead, such a recognition appears to have had little impact on particular sciences which in general only appear to trace their ideas back only a half-way house to satisfy their immediate purposes and methods. These particular basic notions of each science are derived from the philosophical intuitions which form the background of everyday civilised thought in a particular age. In other words, the ordinary language of society does not express these notions but only presupposes them, as in the example of tables and chairs presupposing the specialised scientific notion of material bodies.[1]

Thus, we may summarise Whitehead's description of the task of philosophy as assisting in the development of the understanding that the definition of the continuing ideas is through a step by step gradual process. Even if it is not possible to produce the complete metaphysic, it is possible to produce a series of partial systems of limited generality, any one of which could contain enough basic notions to demonstrate the scope and virility of the total scheme of thought. Recognition of this doctrine of limitation is important, and can be illustrated by the notion of material bodies mentioned above or from the demise of the confidence demonstrated in the scientific developments from the 17th Century onwards[2] By the 20th Century that initial breakthrough was observed as being in a state of complete collapse of confidence in the dominant, fundamental notions of physical science. Whitehead states quite categorically that:

> "This collapse of nineteenth century dogmatism is a warning that the special sciences require that the imaginations of men be stored with imaginative possibilities as yet unutilized in the service of scientific imagination."[3]

This affirmation by Whitehead, that imaginative intuitions of humanity have been required and will always be required in the utilisation of scientific theory, possibly represents a turning point in his own thinking on the subject of the relationship between science and philosophy.

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1. AI p144, 2. AI p145, 3.AI p146.

Observations on Whitehead's description of the Relationship between Philosophy and Science

There is no general agreement among so called 'philosophers of science', as to exactly what form the philosophy of science should take, or what its subject matter should be. John Losee recognises four types, using Whitehead's notions on the subject as representing one of the four distinct categories. Losee interprets Whitehead as emphasising an important role for: "...the formulation of world-views that are consistent with, and in some sense based on, important scientific theories."[1] Thus, for Whitehead the task is to elaborate on the wider implications of scientific theory, while retaining freedom to speculate upon different categories of ontology used to express notions of 'being'.[2] According to Losee, this accounts for Whitehead's insistence that categories such as 'substance' and 'attribute' should be replaced with those of 'process' and 'influence'.[3]

John Passmore suggests that in advocating such a role for the philosophy of science Whitehead was going against the general trend of his contemporaries, a trend which, by the end of the 20th Century, had become dominant. It insisted upon the total independence of physics and metaphysics. Duhem and Mach, for example, insisted that physics: "...owed nothing and could contribute nothing to traditional philosophy.".[4] Thus, Whitehead's metaphysical approach stands in stark contrast with recent trends in the philosophy of science.

R Palter agrees with Passmore's categorisation of Whitehead's approach and the status awarded to him. According to Palter, Whitehead is a natural scientist turned philosopher, distinguished post 1924 by his metaphysical analysis of nature. For Whitehead, the philosophy of nature and the philosophy of science are synonymous, for he interprets both as referring to the bases of fundamental theories associated with the natural world. This is

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1. John Losee, An Historical Introduction to the Philosophy of Science, OUP, NY, 3rd Edition, 1993, p1
2. John Losee, An Historical Introduction to the Philosophy of Science, OUP, NY, 3rd Edition, 1993, p1 3. MT 173-232,
4. John Passmore, A Hundred Years of Philosophy, Penguin Books, 2nd Edition 1968, p229/30.

in contrast with the academic work in the field of the philosophy of science in the last fifty years, which pays little attention to the notions of the natural sciences. The work of those modern academics has no connection with Whitehead's endeavour: "...to illuminate the scientific theories which they themselves and their contemporaries were in the process of developing."[1] Thus, the philosophy of science as set out by Whitehead bears little relation to the subject under that name today. Palter believes that Whitehead used his philosophy 'heuristically', for example, by his elaboration of an alternative to Einstein's Relativity Theory, i.e. Whitehead suggests the study of Einstein's philosophy in order to find items relevant to current work in the natural sciences. This applies even if Whitehead was incorrect regarding both theory and practice, for his belief concerning the relationship between science and philosophy was anything but eccentric, being held by Einstein himself, as well as Bohr, Schrodinger and Heisneberg.[2]

Ivor LeClerk also traces the development of Whitehead's notions on science and the philosophy of science, from the time of his writing of PNK. He regards his philosophical interest as commencing in the 1890s through the realisation that new physical theories completely destroyed the Newtonian cosmology,[3] but at this period, which was the time of writing 'The Principles of Natural Knowledge', Whitehead had not clearly established any distinction between 'philosophy' and 'science'. An investigation into physical science meant an investigation into the very foundations of nature. According to Leclerk - referring to the report of Victor Lowe that in his later years Whitehead expressed doubts as to whether there was such a thing as 'philosophy of science'[5] - Whitehead describes his subject as 'natural philosophy', 'philosophy of nature' and 'philosophy of science',[4] Although he did at times use the word 'philosophy', to make a distinction between the totality of all that the word 'science' included, this distinction was not always clear.

1. R Palter, Whitehead and the Philosophy of Science, International Studies in Philosophy, Spring 1980, Vol.12, p81.
2. R Palter, Whitehead and the Philosophy of Science, International Studies in Philosophy, Spring 1980, Vol.12, p81.
3. Ivor Leclerk, Whitehead's Metaphysics, George Allen and Unwin Ltd. 1958, p5.
4. Ivor Leclerk, Whitehead's Metaphysics, George Allen and Unwin Ltd. 1958, p9.
5. Ivor Leclerk, Whitehead's Metaphysics, George Allen and Unwin Ltd. 1958, p5.

According to Leclerk, Whitehead first considered the foundations in classical physics on which the Newtonian scheme was constructed, discovering that the scheme presented considerable difficulties:

> "Newtonian physics is concerned to express in precise mathematical terms the transitions of a particle or of the configurations of material particles. To do so it must take the relative spatial positions of the particles at one durationless instant of time, and then at a later instant. For classical dynamics, therefore, the configuration of material particles at a durationless instant of time is the ultimate fact."[1]

Even if we conceive of a succession of facts as described in the Newtonian scheme, each one is involved in its own separate durationless instant such that no particle is itself in transition. This rejection of the doctrine of simple location, as expressed in Science and the Modern World[2], was extremely important, for it recognised that Newton's dynamics demanded an explanation in terms of velocity, acceleration and a state of change.[3] Newton's dynamics contained a contradiction between a precise mathematical description of the transition of a particle or configuration of particles, and their interpretation in terms of different positions in succeeding durationless instants. It was this, according to Leclerk, which made Whitehead aware of the need for a new look at the facts. The factors involved in transition must in some way be able to account for the transition which the state of change implies.[4] Whitehead's criticism of these fundamental notions of Newtonian physics is particularly important in view of the movement away from them and towards other conceptions by modern science.[5] This established the methods and direction Whitehead was to adopt.

> "His endeavour was to formulate a conception of the ultimate facts of physical science, and specifically of modern physical science, such as would be consistent with experience, and free from the inner contradictions of the old theory."[6]

Leclerk reminds us of Whitehead's own words. "In the philosophy of science we seek the general notions which apply to nature, namely, to what we are aware in perception."[7]

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1. Ivor Leclerk, Whitehead's Metaphysics, George Allen and Unwin Ltd. 1958, p6.
2. SMW p61ff,
3. Ivor Leclerk, Whitehead's Metaphysics, George Allen and Unwin Ltd. 1958, p6.
4. Ivor Leclerk, Whitehead's Metaphysics, George Allen and Unwin Ltd. 1958, p7.
5 Ivor Leclerk, Whitehead's Metaphysics, George Allen and Unwin Ltd. 1958, p8.
6 Ivor Leclerk, Whitehead's Metaphysics, George Allen and Unwin Ltd. 1958, p8.

The task is then deliniated by Whitehead as the study the different departments of knowledge and their relations in order to establish some unifying concept between the sciences. It is from this that the main task of the philosophy of natural science became to clarify our concepts of the whole of nature, through which an understanding and explanation of nature could then be achieved.[2] This should include the relationships of its entities which would then enable an understanding of its laws to develop. It is in the establishing of relations between these different bodies of knowledge which gives meaning to the idea of the one subject of 'science' as a whole, where the word is used as a collective noun.[3] However, he was of the opinion that Whitehead, at the time of the publication of 'Concept of Nature', was still not expressing a clear distinction between 'philosophy' and 'science'. This was clearlt as a result of his desire to avoid any contamination with metaphysics.[4]

Herman Wein sets out to compare the purposes of Whitehead and Kant, in their opposition to the isolation of science as one absolute authority in its own right, separate from and above other human endeavours. The attempt gains its success largely through science totally neglecting any references in its own work, to the fact of human existence and its progress as expressed in humanism. The process is referred to by Wein as 'degrading or 'de-humanizing' science. Wein classifies Whitehead as one of the few, alongside Immanuel Kant, Charles Sanders Peirce, Nicolai Hartmann and Karl Jaspers who defend what he calls the 'humanism of scientific procedure'.[5]

Wein highlights Whitehead's conviction that the search for truth is deeply rooted in human nature, praising Whitehead's efforts to widen the base of subjects from which scientists

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1. CN p28, 2. CN p46,
3. Ivor LeClerc, Whitehead's Metaphysics, An Introductory Exposition, George Allen & Unwin, Ltd. 1958, p9.
4. Ivor LeClerc, Whitehead's Metaphysics, An Introductory Exposition, George Allen & Unwin, Ltd. 1958, p11.
5. Hermann Wein, In Defence of the Humanism of Science: Kant and Whitehead, In: The Relevance of Whitehead, Ed. Ivor LeClerk, George Allen & Unwin Ltd. 1961, pp289-315 The Muirhead Library of Philosophy, Ed. H. D. Lewis, p289.

choose their material, thus enlarging the domain of science. He approves wholeheartedly of Whitehead's assessment of the importance of the Graeco-European tradition in science. This tradition is challenged by the new conception, the purpose of which is to gain knowledge and understanding of the world through a science which ploughs a single furrow, deviation from which is not permitted. Wein sees Whitehead making a 'bridgehead' between the achievements of rational thought and science. He believes that this kind of exercise is essential in the attempt to relate our knowledge of nature to the existence of rational human beings, a theme which would gain Whitehead's whole-hearted approval.[1]

William P. D. Wightman, recognised the direction Whitehead was to take in his major philosophical work, when Whitehead stated: "The discussion of the deduction of scientific concepts from the simplest elements of our perceptual knowledge at once brings us to philosophical theory."[2] It meant that, for Whitehead, that any evaluation of the nature of science and its worth would be a philosophical exercise. However, according to Wightman this did not imply it would be a metaphysical one in an ontological sense. It could perhaps be called 'meta-scientific'. Although this may be regarded as an expression of the need for a re-examination of the foundations of science, according to Whightman, it was also a rejection of any idea that through science it would be possible to establish ultimate realities. He cites Whitehead's approval, expressed in 'Principles of Relativity', at the words of Poynting declaring the belief that, the ultimate aim of philosophy should be the description of the sensible in terms of the sensible. According to Wightman, this is the nearest that Whitehead ever came to suggesting that the answers to scientific questions would only receive answers from within science.[3] However, at the time of the publication of 'Concept of Nature' Whitehead was still not expressing a clear distinction between

1. Hermann Wein, In Defence of the Humanism of Science: Kant and Whitehead, In: The Relevance of Whitehead, Ed. Ivor LeClerk, George Allen & Unwin Ltd. 1961, pp289-315 The Muirhead Library of Philosophy, Ed. H. D. Lewis, p290/291
2. William P D Wightman, Whitehead's Empiricism, In: The Relevance of Whitehead, Ed. Ivor Leclerc, George Allen & Unwin Ltd., 1961, pp335-350 The Muirhead Library of Philosophy, Ed. H. D. Lewis, p337.

'philosophy' and 'science' as a result of his desire to avoid any contamination of his work by metaphysics.[1] It was in his attempts to achieve a more complete scheme that Whitehead was slowly driven to the consideration of questions beyond the accepted bounds of those of a purely scientific nature. These new areas of thought, such as the clarification of the relationship between events and objects, were what came to be regarded as being truly 'philosophical' and distinct from scientific ones. Concentration upon Whitehead's earlier works with their apparent rejection of metaphysics has misled many into missing the true revolution which Whitehead brought about. At the outset Whitehead had based his philosophy on the dictum that philosophy was to be concerned with the physical world. It is a philosophy of nature which can later be enlarged to include the general notions of 'Being' and 'Reality'.[2] It is as a result of an analysis of 'The Principles of Natural Knowledge' and 'The Concept of Nature' that have misled many into misunderstanding the nature of his works and miss the point of the revolution which he ultimately brought about.[3]

Summary

Whitehead's analysis of the development of philosophy and science, from the Greek period onwards to the 20th Century, recognised the loss of the initial harmony which existing between the two until the 16th Century, as a result of the 17th Century Scientific Revolution. Initially the main interest had been in generalities, the understanding of which was based upon rationality. The Greeks had developed a scientific method based upon classification and function. The divergence and loss of the harmony between the two occurred as a result of the outstanding success of the new physics. The dichotomy

1.William P D Wightman, Whitehead's Empiricism, In: The Relevance of Whitehead, Ed. Ivor Leclerc, George Allen & Unwin Ltd., 1961, pp335-350, The Muirhead Library of Philosophy, Ed. H D Lewis, p338.
2.William P D Wightman, Whitehead's Empiricism, In: The Relevance of Whitehead, Ed. Ivor Leclerc, George Allen & Unwin Ltd., 1961, pp335-350, The Muirhead Library of Philosophy, Ed. H D Lewis, p336.
3.William P D Wightman, Whitehead's Empiricism, In: The Relevance of Whitehead, Ed. Ivor Leclerc, George Allen & Unwin Ltd., 1961, pp335-350, The Muirhead Library of Philosophy, Ed. H D Lewis, p338.

continued throughout the 18th and 19th Centuries and on into the 20th. Science concentrated upon the objective physical world and philosophy upon the subjective world of the mind. Only in the 20th Century was there a reunion of these two, in the work of William James.

Whitehead outlined the destructive effect on science, of its adoption of an anti-rationalistic stance and the simultaneous concentration upon the narrow abstraction of physics. This was the result of the rejection by science of any 'outside' explanations for a cosmology. As a result science has become ineffective. Whitehead's response, in order to regain a true status for philosophy, was to advocate the adoption of metaphysics, in the interpretation of the scientific evidence. Rationality would be pushed to its limits until the irrational is discovered. In this way what is ultimate or 'given' would be revealed. For this method to be successful the philosophical scheme must be presented with strength and confidence and in so doing any conflict between common sense and experience would be avoided. The role of mathematics in the functioning of this philosophical scheme would be of paramount importance, but that it is incapable of establishing a sound cosmological theory alone, must be recognised. The aim of philosophy, according to Whitehead, is simply to disclose the evidence which can then be used to reveal the true nature of things.

The final part of this section was used to present a variety of interpretations of Whitehead's philosophical scheme, its aims and its achievements. There was no consensus of opinion as to whether Whitehead had always been sympathetic to the reliance of metaphysics as the means of achieving his purpose, but there was agreement that basing his philosophy of science upon metaphysics led to the rejection of his work by many of those at the heart of philosophy of science in the 20th Century. It was in his challenge to Newtonian science as the sole basis for a philosophical cosmology, that Whitehead was able to unite his understanding of the philosophy of physical science with our concepts of the whole of nature.

4 Metaphysics and the basic thesis; that an adequate philosophical cosmology is one based upon the Philosophy of Organism.

Introduction

This section we will be in two parts. We will commence by analysing Whitehead's use of metaphysics for the establishment of scientific first principles, and the expression of those principles in terms of general ideas. Consideration will be given to the reasons offered by Whitehead for the recognition of the essential role played by metaphysics in relation to the interpretation of the deeper issues of his scientific scheme. The rejection of this method by those in the domain of a rigid empiricism will be noted. The first part will conclude with consideration as to why Whitehead was 'converted' to metaphysics after his apparent previous opposition to their inclusion in the formation of scientific schemes.

The second part will be devoted to the basic thesis of Whitehead's philosophy that an adequate philosophical cosmology must be based upon a philosophy of organism, i.e. an adequate cosmology is an organological cosmology. This will include analysis of Whitehead's claim that only an organological philosophy can provide the basic framework for scientific thought, including the physical sciences and that such a philosophical cosmology is part of 'Speculative Philosophy' or 'Rationalism'. We will assess some of the counter arguments to Whitehead's claim as well as some of the answers which have been proffered in defence of speculative philosophy.

Metaphysics

There is a view that there has been no generally acceptable delineation of the subject of metaphysics . According to D. W. Hamlyn, 'the exact nature of the subject has been constantly disputed'.[1] However there appears to be agreement on what may be termed 'the central part' of metaphysics as concerned with 'being' or 'ontology', the content being concerned with entity, object, the individual and the universal.[2] It is this supposed abstract vagueness which demonstrates to many a need to justify its relevance.

1. D. W. Hamlyn, The History of Metaphysics, In: The Oxford Companion to Philosophy, Ed: Ted Honderich, pp556-558.

According to Whitehead the true metaphysical debate is to consider the nature of things as a whole, before embarking upon any special investigation into the detail.[1] "By 'metaphysics' I mean the science which seeks to discover the general ideas which are indispensably relevant to the analysis of everything that happens."[2] It is that part of philosophy which attempts to conceive and explain the general idea of a thing in terms of its basic notions. Hence, Whitehead's concept of the notion of metaphysics is strongly influenced by the nature and procedure of the enquiry. His description of metaphysics is of a philosophy of first principles. It relates to the fundamental questions which we can ask regarding basic and primary fact, facts of a fundamental nature, because metaphysics deals with ultimate fact. As a result it is part of a major attempt to answer the question what is a complete fact by establishing the nature of apparent reality. To discover the fundamental notions will be to discover a complete fact. Thus the quest in metaphysics is to discover 'general ideas'. These fundamental notions have to be general, in order to account for every element of our experience.[3]

But 'general ideas' in metaphysics do not simply mean 'general', for all knowledge, including science and philosophy, contains general ideas, and both science and philosophy are attempting to understand things in terms of general principles.[4] According to Whitehead, the first step in science and philosophy has only been taken when it can be recognised that every routine, event or fact is an example of a principle which can be encapsulated in an abstraction quite separate from its exemplification.[5] In other words, facts reveal characteristics which are general in nature and which can be exemplified in other facts. This implies that science and philosophy are both attempting to understand things in terms of general principles.[6]

It is when we attempt to consider the scientific movement in relation to what Whitehead refers to as the 'deeper issues' that we recognise the need for general metaphysical

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2 A. R. Lacey, A Dictionary of Philosophy, Routledge & Kegan Paul Ltd., 1976, Third Edition 1996.
1. SMW p195, 2. AI p128, 3. PR p4, 4. AI p179, 5. AI p180/1, 6. PR p179.

principles.[1] By deeper issues Whitehead means the things recognised by Plato in his seven generalities which included our Ideas, The Physical Nature, The Eros, The Mathematical Relations, The 'Receptacle' and The Harmony. The harmony itself is a composite of Truth, Beauty, Adventure, Art and Peace, so Whitehead can speak of the need of a Harmony of Harmonies.[2] But such headings do illustrate the major difficulty for metaphysics of expressing in explicit terms, the nature of these larger generalities. Whitehead suggested that it is at this precise moment that the language of literature breaks down. Thus the goal of the metaphysical debate ought to be to establish the final generalities, which are themselves not the point of commencement but the objective.[3]

Whitehead stressed the importance of recognising the subjective element involved in metaphysics, for conscious thought is essentially selective and philosophy must recognise that fact: "The task of philosophy is to recover the totality obscured by the selection."[4] Prof. Emmet describes this task as the connection between rationality and the basic concepts of the philosophy of organism. She refers to Kant's recognition of the mutual implications between the notions of rationality, morality and the universality of freedom. All these are important to the philosophy of organism because its self appointed task is to attempt to discover the general principles which are universally applicable.[4] Metaphysical first principles are always present and this makes it more, not less difficult to apprehend them i.e. they are not found through direct observation, they have to be brought out into the open. The question is then as to whether they form a coherent scheme which can assist in the explanation of our experience of nature.[5] Unlike the world of Kant, which is constructed from objective experience, the philosophy of organism recognises the experiencing subject arising from the world which it feels and of which it is a part. It is then able to construct its own nature from the way in which it feels that world of experience. Emmet's conclusion is that for this reason Whitehead's scheme is adequate for interpreting the structure of what is given[6] and that there is sufficient reason in his

1. SMW p195, 2. AI p284/5, 3. PR p10, 4. PR p15,
4.(Dorothy Emmet, 1966, p35) 5. (Dorothy Emmet, 1966, p37)
6. (Dorothy Emmet, 1966, p49/50)

support, to legitimise his attempt.[1]

An important ingredient in the metaphysical test is that of universality. The authority of a metaphysical scheme comes from within itself because of its necessary connection with all human experience. It must be able to be 'interpreted' by experience.[2] Whitehead explains 'interpreted' as meaning that there are no items which are incapable of being interpreted.[3] This interpretation will take place in relation to the application of the principle, through the empirical side of the testing in experience in the real world. Thus the characteristic of a metaphysical idea is that it is universal, necessary, and coherent, in so far as it is part of a system, which is logical, applicable and adequate. However, we should always bear in mind that it will never be possible to arrive at a perfect formulation of metaphysical first principles. They will act as metaphors which can assist in an 'imaginative leap'. A first principle may appear in a flash of insight, but the limitations of language and weakness of insight will always be present. We only progress towards them in fact, in an asymptotic manner.[4]

The universality of the metaphysical scheme is demonstrated by Whitehead when he suggests that the same description of the nature of perception based upon his organological scheme, including the notion of causal efficacy, can be expressed in terms of the language of physics:

> "Generalising from the language of physics, the experience of M is an intensity arising out of specific sensa, directed from A, B, C. There is in fact a directed influx from A,B,C, of quantitative feeling, arising from specific forms of feeling. The experience has a vector character, a common measure of intensity, and specific forms of feeling conveying that intensity."[5]

Whitehead suggests that by substituting the terms 'energy', and 'form of energy' for the concept of 'quantitative emotional energy' and 'specific form of feeling' respectively, and at the same time remembering that in physics the term 'vector' represents a 'definite transmission from elsewhere', we will realise that the metaphysical description of the simplest constituents of the actual entity[6], is in agreement with the general principles involved in the formation of the notions utilised in descriptions within modern physics.[7]

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1. (Dorothy Emmet, 1966, p64) 2. PR p4, 3. PR p3, 4. PR p4, 5. PR p116

Thus, we can argue that the datum in metaphysics has at its base the vector theory in physics, and that the quantitative element has the scalar localisation of energy. The 'sensa' in metaphysics is the equivalent of the diversity of the particular forms in which energy expresses itself.

Whitehead's conclusion is that the general principles of physics which lie behind its general notions, are precisely those which would be expected from any reconstruction derived from the metaphysics required by the philosophy of organism. Thus, light is thrown on scientific principles by metaphysics and avoids the defect of many modern philosophies which fail to involve metaphysics. Whitehead believes that there should be a reciprocity between science and metaphysics, with science investigating particular species and metaphysics investigating the generic notions, under which the specific principles should appear.[1] The failure of science to incorporate metaphysics may be an important reason for the scarcity of metaphysical literature in the realm of science, representing the failure of science to tackle such fundamental problems as that of the paradox of the flow, or flux, of creation and its permanences. The task of providing this kind of literature is usually left to those of a religious nature.[2]

Wolf Mays describes this radical comparison between the elements of experience and the notions of physics, as complete an identification as anyone could expect to find. He interprets Whitehead as saying that in the same way that an experience of emotional intensity is enclosed in some specific sense-datum, so also in physics energy reveals itself in different forms i.e. in the form of electrons or photons and the like. The assumption Whitehead is making is that the physical factors of physics, differ in a similar way to those of emotional intensities. But, according to Mays, it is also such an assumption that

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6. Whitehead's notion of the 'actual entity' will be discussed in detail in the next section. However, it is of significance now because it is at the heart of the whole organological scheme. The general characteristics of the actual entity are described by Whitehead as 'metaphysical': "The metaphysical characteristics of an actual entity - in the proper general sense of 'metaphysics' - should be those which apply to all actual entities." (PR p90) Actual entities are "...the final real things of which the world is made up." PR p18.
7.PR p116, 1. PR p116, 2. PR p208.

permits Whitehead to claim that the general principles of physics are exactly what we would expect to find if we reconstructed them from the underlying assumptions of the philosophy of organism. On this basis Whitehead can certainly claim that the philosophy of organism appeals to the facts.[1] Mays finds great difficulty in equating 'scalar localisation', 'vector transmission' and 'forms of energy', with 'a bang in the eye', 'someone running after a train' or a 'beautiful landscape'.[2]

Mays recognises a further complication as a result of Whitehead employing the same language to describe our direct experience of the world as he does in his description of the physical world. Ambiguity enters in the use of such terms as 'quantitative feelings' to describe both a low grade form of emotional intensity and particular forms of energy, which Whitehead regards as the primitive forms of energy which we experience in our sense data.[3] Mays is also unhappy with Whitehead's attempt to draw an analogy between the transference of physical energy and what is referred to as a 'stream of direct experience', which is in reality Whitehead's doctrine of the subject as 'subject-superject',[4] and what is essentially an electromagnetic field. This is because, according to Mays, the doctrine of the transference of energy of the subjective form appears to be modelled on a description of the transmission of energy in electrical systems with radiation. Mays finds justification for the association of physical energy with human experience in Whitehead's own reference to Poynting's Flux of Energy in Electrodynamics,[5] but he does not believe that the link between 'emotional intensity' and 'physical energy' has been satisfactorily demonstrated by Whitehead.[6]

However, and in spite of such reservations, the question as to whether the avoidance of metaphysics is justified, has to be answered. Whitehead suggested that Locke is a classic example of those rejecting metaphysics in the face of the obvious evidence of its necessity. In Locke's case it was probably the result of an a-priori dogma. His failure to be totally

1.PR old 164, 2.(Wolfe Mays, 1959, p211) 3.(Wolfe Mays, 1959, p212)
4.(For an explanation of this term see Chapter Two, Section 6) 5.AI p238,
6.(Wolfe Mays, 1959, p210)

consistent with the application of his empiricism is shocking to empiricists but should in fact be a pointer to the necessity of employing metaphysics. But as Whitehead points out, the necessity of his inconsistency is what most people would have expected. Locke's avoidance of metaphysics took him to the point where it made their necessity obvious for the sake of clarity. Furthermore, according to Whitehead, his philosophy does contain at least one aspect which can be developed into a metaphysic,[1] and both his philosophy and the philosophy of organism have human experience as the foundation of their description of their metaphysics.[2]

For Whitehead, the reason why metaphysics is involved is that, along with rationality, metaphysics is part of the hope of all the sciences. This hope is that we should never find through our experiences, any element which is intrinsically incapable of demonstrating an element of some general theory. This claim on behalf of metaphysics is justified because it enables us to discover the relationships of things. Whitehead suggests that the retention of such a faith is the result of an intuition into the nature of intellectual activity, and it is this which justifies the hope. It is on this issue that science and metaphysics pass over into religion. This faith is an ideal which is seeking a satisfaction and in so far as we believe that doctrine we are rationalists. The argument can be made without denying any recognition of the fact that there may be a limit to the way in which a theory is capable of explaining all the elements of the universe.[3]

We do not have to be apologetic or defensive on the use of metaphysics. According to Whitehead, Bacon made a mistake in rejecting metaphysics from any part of his scientific calculations. As observed in the section above the very nature of the inductive method which he described and introduced is based upon metaphysics.[4] Thus reliance upon rigid empiricism in order to establish laws of nature is not possible. Observations both prior and subsequent to the formulation of a particular description of an occasion have to resort to metaphysics. This simply endorses the fact that any system requires for its endorsement metaphysics and larger generalities. Whitehead uses the example of flying, to demonstrate

1. PR p146, 2. PR p112, 3. PR p42. 4. SMW p55,

the need for imagination and rationalism in order to supply what direct observation lacks:

> "Thus the first requisite is to proceed by the method of generalisation so that there is certainly some application; and the test of some success is application beyond the immediate origin. In other words, some synoptic vision has been gained.[1]

Thus, according to Whitehead, philosophic generalisation means using specific notions by applying them to a particular and restricted group of facts, for the purpose of discovering the related generic notions which apply to all facts. Whitehead recognised that the failure to apply these constraints methodically and rationally within the borders of natural science will lead inevitably to inconsistencies. To leave the parameters of natural science and become dogmatic, produces irrationality.[2]

It has been popular to make a distinction between the rationalism of a particular science and its successes, and the construction of ambitious schemes which attempt to formulate a theory of the general nature of things. To justify this distinction, it is popular in some quarters to highlight the number of abandoned the failed metaphysical schemes which have been constructed. Whitehead's answer to this, is to point to the similar number of abandoned scientific schemes: 'We no more retain the physics of the seventeenth century than we do the Cartesian philosophy of that century.'[3]

It is by the nature of these questions that we are put into the position of recognising the need to consider these issues dispassionately. This investigation into the nature of things has to come before any enquiry into the detail of things. It is this very standpoint is what is termed 'metaphysical'.[4] Thus the role of metaphysics, according to Whitehead, is derived from three things; firstly, direct knowledge of events from which our immediate experience is composed, secondly, the need to harmonise any systematic accounts of

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1. PR p5, (See footnote side 115)

2.PR p5. Donald W Sherburne states that there is no hint of dogmatism in Whitehead's own attitude. "It may be doubted whether such metaphysical concepts have ever been formulated in their strict purity - even taking into account the most general principles of logic and mathematics. ... In philosophical discussion, the merest hint of dogmatic certainty as to finality of statement is an exhibition of folly." PR p90 (Sherburne, 1966, p229/230)

3. PR p14, 4. SMW p195.

different types of experience, and thirdly, to provide the concepts which will be the framework through which our epistemology can be expressed. This is in order to be able to produce an account of the general character of what is known as a whole. Thus an important role of metaphysics is to enquire into how knowledge is possible, within the framework of what is known.[1]

It is true that the collapse of rigid empiricism and naïve inductivism has brought with it its own peculiar problems. For example, if the data for our observations is to be provided by the whole universe, and the normal method of assessing our immediate experience is through analysis of the constituents of our own limited experience, the question must arise as to how we are to distinguish and separate the detail of the immediate, from the totality of experience as a whole? It is usual to proceed by noting the differences from one occasion to another, as when a thing is present or absent, for example. But because the universe continues to be the same way in our perspective, we are not able to employ this method of comparison. If we have nothing else with which we can make a comparison, then we can expect difficulties in our search for the larger generalities and first principles.[2]

Thus if one of the aims of metaphysics is to discover the ultimate elements of the universe, it will include tracing, in outline at least, the genetic process of creation.[3] This fact is recognised by the philosophy of organism in its attempt to describe the nature of an actual entity as the foundation of its scheme in terms of all actual entities. Whether the task of producing such a scheme of metaphysical concepts can ever be completed in all its entirety, may be doubted, but by restricting thought to societies of sufficient width, while at the same time ensuring that they each represent a percentage of all actual entities, it may be possible to establish some causal laws of particular societies.[4] Thus the role of metaphysics is to pursue rationalism to its limits.

Contrasted with his assertion that discussions on the philosophy of science are usually metaphysical, Whitehead also stated that the introduction of metaphysics is like:

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1 SMW p196. 2. PR p5, 3. PR p219, 4. PR p90.

"... throwing a match into the powder magazine. It blows up the whole arena."[1] One possible solution to this apparent contradiction, is to recognise the different contexts in which Whitehead is referring to metaphysics. In Concept of Nature the debate involves the nature of perception, where there is a three way process between the perceiver, the mind of the perceiver and what is perceived, concerning our sense perception of the world. Whitehead tells us that 'perception' and the conditions of perception are assumed, on the basis that something has been perceived. It is the synthesis of the 'knower' or perceiver, and the 'known' as what is perceived, which is to be left to metaphysics. Whitehead deals with this matter elsewhere, in a description which is part of his metaphysical scheme,[2] suggesting that either it is not metaphysics itself which is under attack or he has experienced a change of heart towards the role of metaphysics:

> "The immediate thesis for discussion is that any metaphysical interpretation is an illegitimate importation into the philosophy of natural science. By a metaphysical interpretation I mean any discussion of the how (beyond nature) and of the why (beyond nature) of thought and sense-awareness. In the philosophy of science we seek the general notions which apply to nature, namely, to what we are aware of in perception. It is the philosophy of the thing perceived, and it should not be confused with the metaphysics of reality of which the scope embraces both the perceiver and perceived. No perplexity concerning the object of knowledge can be solved by saying that there is a mind knowing it."[3]

The emphasis here is on a major doctrine of Whitehead's, presented in both PNK and CN that there is a world to be perceived and it is independent on mind. Such a doctrine is a denial of Cartesian Duality with its distinction between the role of the mind and the apparent world. Whitehead could be interpreted as stating that this is quite a separate debate from that which deals with the need of a metaphysic within science in the interpretation of what is perceived.[4] Thus, the different contexts in which metaphysics are considered is significant. It was necessary for Whitehead, first to challenge the Cartesian duality of mind and matter, as a premise underlying his metaphysical arguments, before analysing the utilisation of metaphysics generally. This interpretation is congruent with Whitehead's later challenge to the application of Cartesian metaphysical interpretations of perception as being in error. On this basis, it is the different contexts that would account for the differing comments, rather than interpreting them as apparently incompatible.[5]

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1. CN p29, 2.SMW p89, 3.CN p28, 4. PNK, Introduction to the Second Edition 1925,

However, there is evidence to suggest that Whitehead did experience a kind of 'conversion' in favour of a recognition of a need for metaphysics. It is clear that his earlier works appear to be much less sympathetic towards metaphysics than those of his later period. Explanations for this apparent conversion to metaphysics have been offered by several commentators. Nathaniel Lawrence emphasises Whitehead's statement that it was his intention, soon to embark upon a wider enquiry into the fundamentals of nature: "...to embody the standpoint of these volumes in a more metaphysical study".[1] Nathaniel Lawrence and many other scholars regard this as marking the culmination of Whitehead's earlier period, when he did indicate the direction of his new study. His changed attitude to metaphysics was the direct result of the fulfilment of his aspirations to expand and 'embody' his earlier scientific theories in a more detailed description.

Ivor Leclerk takes a slightly different view by suggesting that the change in attitude was the result of Whitehead consciously deciding to turn to a completely different set of problems from those specifically scientific in nature. The new preoccupation had serious repercussions on his earlier theories and notions. This interpretation relies heavily on emphasising the phrase 'embody the standpoint' as meaning that the mathematical and scientific period would simply be the base from which to start, but that the new enquiry would be separate, involving a comprehensive metaphysical enquiry: "Whitehead was steadily driven to taking into account considerations other than the scientific, considerations which he later came to recognise as being properly philosophical ones."[2]

Whitehead outlined the main task of the philosophy of science as the elucidation of the concept of nature, which presents itself to us as one complex fact to be investigated. The aim was to demonstrate the fundamental entities and their relations, thus revealing the

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5. PR p8.

1. Nathaniel Lawrence, 'Whitehead's Philosophical Development: A Critical History of the Background of Process and Reality, University of California Press, Berkeley and Los Angeles, 1956.

2. Ivor LeClerk, 'Whitehead's Metaphysics', An Introductory Exposition, George Allen and Unwin Ltd. p 11

laws of nature under which they operated.[1] LeClerk describes the driving force of Whitehead's new development as the doctrine of 'event', which led to the theories of 'extensive connection' and 'extensive abstraction'. These were put forward as the answer to the failure of the doctrine of simple location. However, recognition of the inability to look to science for the necessary information and method to complete the task of the enquiry would leave a vacuum when answering the question which Whitehead has posed for himself, in the enquiry.

It is LeClerk's belief that it became clear to Whitehead that the answer to the question of the ultimate concrete fact or entity on which nature is founded, could not be answered merely on the basis of what science could offer. The new task was to be based upon metaphysics and philosophy, where metaphysics means an investigation into the ultimate nature of reality.[2] It is then that the result of the enquiry becomes the philosophy of organism. Thus the turning to metaphysics and the construction of a metaphysical system is not the contradiction it might at first have appeared to be.

The main difference between these two opinions, of Lawrence and Leclerk, appears to be nothing more than how quickly Whitehead actually recognised that his new direction would lead him into areas of controversy over metaphysics, for both recognise a distinct change of direction. For Lawrence, Whitehead's change of attitude is the direct result of the intended expansion of his field of study. But why chose a field of study of which you have no confidence? Rather than conclude that his change of attitude to metaphysics was the result of the fulfilment of his new aspirations, it is surely more likely that, assuming Whitehead meant exactly what the words suggest regarding the powder keg, his attitude must have already changed in order to find the stimulation and interest in the subject that he clearly did and which provided him with the desire to pursue it.

According to Leclerk, Whitehead was choosing to turn from his subjects of the earlier period, which were scientific in nature, leaving them as a detached base, although they

1. CN p46, 2. AI p203.

were the starting point of his new enquiry. What is clear is that the new enquiry would be separate and of a metaphysical nature. But then we are told that it became, as it were, a new recognition on the part of Whitehead that reliance upon the empirical sciences alone would not be a sufficient base to provide the answers to the questions which he had posed for himself.[1] This leaves us with the question as to why Whitehead posed questions of a metaphysical nature before his acceptance of the need for metaphysics. The aim of both these answers, of Lawrence and Leclerk, is to avoid the apparent contradiction which the different quotations appear to present and neither of them are convincing in this task. In neither case did Whitehead appear to be aware of the dangers that metaphysics might bring to his earlier notions, such that the description of his conversion to the view of the absolute necessity of metaphysics in the completion of his new task, still require careful consideration.

A Philosophical Cosmology and Speculative Philosophy

A philosophical cosmology as Whitehead conceives it is part of speculative philosophy. It is: "...the endeavour to frame a coherent, logical, necessary system of general ideas in terms of which every element of our experience can be interpreted."[2] By 'interpreted' we are led to understand, all the things of which we are conscious, which means things, we enjoy, we perceive, what we think or will. Such categories will be represented in the general scheme. This is in order to do justice to the ideal of speculative philosophy that its fundamental notions are not capable of abstraction from each other.[3] This observational data which is the basis of the philosophic cosmology must include the conclusions of physical science as well as those things involved in the sociological functioning of humanity.[4] The scheme of cosmological ideas will be sufficiently elaborate as to be able to be confronted with various topics from experience. From within the cosmology particular topics will find their interconnections.[5]

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1. Ivor LeClerk, 'Whitehead's Metaphysics', An Introductory Exposition, George Allen and Unwin Ltd. p11.
2.PR p3, 3.PR p3, 4.MT p227, 5.PR pxii.

The framework of this philosophical cosmology is not identical with that for the physical sciences, which are concerned with inorganic nature. Whitehead's philosophy is based upon the fact that an organism is a living thing and it is this which is central to his scheme. The status of life in nature is the problem of both modern philosophy and science for it is at the heart or intersection of their concerns. Hence Whitehead's claim that 'life' should be at the centre of our philosophical cosmology for: "...it is the central meeting point of all the strains of systematic thought, humanistic, naturalistic, philosophic. The very meaning of life is in doubt. When we understand it, we shall also understand its status in the world. But its essence and its status are alike baffling."[1] Thus, it will only be when we understand life that we understand the status of the world.[2]

According to Whitehead the first approximation of the notion of life suggests the centrality of self-enjoyment in its constitution, which is manifest in an immediate individuality. This is a complex process of picking up and making into a unity of existence, the variety of data which appears as relevant through the physical processes of nature. The implication of life is of an absolute individual self-enjoyment which arises from the process of 'picking up' or 'appropriation'. It is for this that Whitehead uses the word prehension to express the process of appropriation. That and self-enjoyment are among the basic characteristics of life. Self-enjoyment may be termed 'occasion of experience' or actual entities and are the basic unities of what the world is made up. These are the real things what constitute all actual things in the evolving universe in its creative advance.[3]

Actual Entities or actual occasions, the fundamental real things of which the world, are the entities beyond which it is not possible to go. They are the basic unities which constitute the universe.[4] But they are not simply organic entities. Whitehead ascribes to them what we may call 'proto-psychic' qualities in the form of 'prehension', 'satisfaction', 'self-enjoyment' and 'feeling'. They are manifest in the lower organisms by a 'perception' in the guise of 'uncognitive apprehension'[5] and in the higher organisms by psychic

1.MT p202, 2.MT p202, 3.MT p205/6, 4.PR p18, 5.SMW p86.

and mental powers. These are generalisations of mental characteristics with which, as humans, we are familiar. It is the generalisation of these notions by Whitehead that allows them, sometimes through analogy, to apply to more primitive characteristics and it is to these that we may apply the term 'proto-psychic'.

In short, Whitehead's philosophy of organism makes greater claims simply than that the world is constituted by organisms, as may be understood in a straight forward description. He suggests first, that there is a whole scale of organisms, including most primitive ones, which includes particularly the ones which normally are referred to as inorganic nature, and second, that all organisms, even the most primitive ones, have feelings, aim or self-enjoyment and so on, these terms being understood in a generalised sense.

Further, he claims that his organic philosophy provides an appropriate framework for science. The role of the philosopher is to attempt the enlargement of the understanding and scope of application, of all notions involved in contemporary thought.[1] The scientist enlarges the scope of our knowledge. It is clear from examples such as that of Newtonian dynamics that the scientist and the philosopher can help each other. The scientist may require a new idea and the philosopher may gain enlightenment from the study of scientific consequences. By such actions philosophy may be of help to the sciences.[2] The first step in the understanding of life in the context of physical nature is their fusion together as essential factors in the composition of what is real.

In particular Whitehead hopes that his philosophy of organism is of relevance to the physical sciences and especially to research into what we normally refer to as organic and inorganic nature. It follows from his comments on physics as we know it, and in particular classical physics, that it does not provide an 'in depth' account of its subject matter, i.e. organic nature. In the light of his philosophy, Whitehead's physics provides a superficial prospective of nature, including its organic and proto-psychic constitution.

1MT p234, 2.MT p235,

Furthermore Whitehead considers the principle of 'simple location' to be a major inhibitor within classical physics to the formation of a clearer understanding of nature. It is one of the main reasons why scientists ceased to worry about philosophy. It was the 'fundamental assumption' that was presupposed, thus limiting the number and type of philosophical systems possible. It is the assumption at the heart of the conception of 'concrete' nature, that stuff, matter or material has the property of simple location in space time.[1]

In his speculative philosophical scheme of general ideas, Whitehead referred to the interpretation of every element of our experience.[2] By 'every element' Whitehead means everything of which we are conscious, which we perceive, which is felt through emotion and which we will to be represented in the general scheme. By 'interpreted' Whitehead means that the whole scheme must be both coherent and logical and in regard to its interpretation, applicable and adequate. In this instance 'applicable' means that interpretation is made possible for some items of experience, while 'adequate' means that there must be no item which cannot be interpreted.[3]

Whitehead's description of 'Coherence' means that each entity on its own is meaningless, only gaining meaning from its relationship with other entities. It is togetherness that forms the whole system, and this exhibits coherence: "It is the ideal of speculative philosophy that its fundamental notions shall not seem capable of abstraction from each other." Thus coherence involves everything which we can know or experience. Everything is part of the general scheme of things, and by implication, nothing which it is possible to know should be regarded as separate from the totality of the whole. It is meaningless to consider things in isolation, simply because in isolation things are meaningless. It is the task of speculative philosophy to demonstrate the truth of this:

> "It is an ideal of speculative philosophy that its fundamental notions shall not seem capable of abstraction from each other. In other words, it is presupposed that no entity can be conceived in complete abstraction from the system of the universe, and that it is the business of speculative philosophy to exhibit this truth. This character is its coherence."[4]

1.SMW p61, 2. PR p3. 3. PR p3, 4.PR p3.

Thus, coherence is more than simply insisting that the scheme itself should be coherent, non-contradictory and rationally explicable. Speculative philosophy insists that each thing which constitutes the scheme, should be explicable only when related to the scheme as a whole. Thus, this account of our sense experience of nature attempts to go beyond such things as physical properties, simple location and the extension of space. Whitehead noted that an investigation into the criticism of the reliance of rationality upon coherence can actually be beneficial and that these standards of rationality and coherence should be the standard of all parties in philosophical debate. The avoidance examples from experience in a philosophical scheme may be the result of an attempt to stifle debate concerning facts.[1]

Whitehead recognised that there may also be incoherence in a metaphysical scheme. This he described as: "...the arbitrary disconnection of principles or ideas."[2] But incoherence may be disguised by the newness of a scheme with its novelty, which, when discovered leads to the abandonment of the scheme. Thus, the abandonment of philosophical schemes is more common than their refutation. It is only after the temporary but trivial errors of construction have been recognised and removed, that the true nature of a scheme's inadequacies and incoherence are recognised.[3] According to Whitehead an example of the acceptance of incoherence as the arbitrary disconnection of principles and ideas from one another so that entities can be considered in isolation, abstracted from the surroundings of other entities, is illustrated in the example of the Cartesian duality of two different types of substance, the corporeal and the mental, for which division no reason is offered. This is to make a virtue out of incoherence. The attraction of the philosophy of Spinoza is that he adds coherence to the Cartesian position.[4]

Thus, the understanding of the philosophical scheme could be on the basis that the principles and ideas, as isolated and disconnected complete units, are comprehensible from within themselves and without reference to any other order or system. What would then be lacking in such a description would be any reason as to why they are separate, for without a reason their incoherence in the form of this separateness is irrational. According

1.PR p3, 2. P35 3.PR p6, 4.PR p6.

to Whitehead, irrationality is the rejection of the belief that reasons or general principles are either achievable or necessary. However unlikely it might be that we discover a conscious willingness to be contented with irrationality, Whitehead suggests that the popular positivists, who dominate the intellectual thinking of the present, have adopted such an attitude, for it contentment with an ultimate irrationality that is the basis of the positivists rejection of metaphysics.[1] According to Ivor LeClerk, Whitehead is affirming that the acceptance of incoherence is tantamount to a form of irrationality, for it implies the acceptance, consciously or unconsciously, of an unreasoned disconnection of principles. It is to affirm the impossibility of establishing the necessary reasons or principles, either for the present or at all. It is evident to Whitehead that there can be no 'rational' defence of 'irrationalism'. [2]

According to Victor Lowe, although we should recognise that every metaphysical system is essentially one great complex hypothesis, incomplete and lacking absolutes and certainties, it is not prevented from having a speculative concept of the universe. Recognition of its hypothetical character is simply the recognition that it is the product of human endeavour, with an imperfect presentation of the characteristics of nature which it is attempting to involve. Experience is individual and limited and requires interpretation and it is only through speculation and trial that concepts which come close to expressing adequately, what Lowe describes as: "...the generic traits of existence", can be formulated by the philosopher.[3] The questions permanently challenging the philosopher are first, whether the result of employing this speculative approach produces results which are compatible with our experience of the world in practice, and second, is it adequate as a framework for the notions of the special sciences?.

1.MT p202,

2. Ivor Leclerk, Whitehead's Metaphysics - An Introductory Exposition, George Allen & Unwin Ltd. 1958, p35.

3. Victor Lowe, Understanding Whitehead, John Hopkins Press, Baltimore, Maryland, 1962, p87. Lowe notes the distinction between his use in this context of 'nature' and 'the universe' as synonymous terms, and that the term 'concept of nature' as used by Whitehead in PNK and CN.

Lowe illustrates the meaning of his term 'traits of nature' and their conceptualisation through their employment in the method of induction. According to Whitehead, the employed logic in induction and its use of causal laws is based upon metaphysics. This is immediately clarified by Whitehead's reference to the essential link in the inductive process of past, present and future. "Either there is something about the immediate occasion which affords knowledge of the past and the future, or we are reduced to utter skepticism as to memory and induction."[1] Lowe declares this to be one of the most sound comments ever uttered on induction, for if we do not assume that prior events have an influence on later ones, we are confining our thought to some ephemeral realm. In such a case we would be justified in regarding with suspicion any theory of causal induction, regardless of its clarity and elegance. Thus the scientist, in what he is doing as a scientist in his analysis of nature with his principles of reflection, is dependent upon metaphysical principles. To attempt in some way, to remove the metaphysics from the relationship, as though metaphysical theory was a kind of disease, would indeed be superficial.[2]

The second requirement of the scheme is that it should be logical. The ordinary meaning of the word 'logical' includes consistency, or containing no contradictions, and this is adequate in a philosophical scheme on condition that it is remembered that the notions deemed to be logical find their true place in the entirety of the scheme. [3]. Logical perfection can be recognised and is in no need of explanation. The role of logic in mathematics is a useful example of its true value. [4] The caveat is that philosophy has been misled on this matter of mathematics, by a view derived from Descartes and his use of mathematics in the physical sciences. Leibniz followed suit with his 'universal calculus' which was a great influence on later philosophy. [5].

On investigation we discover that the starting point of mathematics involves as many insurmountable problems as are involved in philosophy, so the question as to why turn to

1.SMW p62,
2. Victor Lowe, Understanding Whitehead, John Hopkins Press, Baltimore, Maryland, 1962, p86.
3, PR p6, 4. PR p6. 5. MT p202

mathematics for a solution is a legitimate one. This reticence holds, in spite of the fact that in mathematics the statement which is untrue or a contradiction can be located relatively easily. This does not apply to philosophy, where it may still be correct in a contradiction to conclude that at least one of the propositions is untrue. The resulting difficulty is in finding out which one is in error.[1] Unfortunately in philosophy there has been the notion that its role is to establish clear and distinct premises as a base for the erection of a deductive system of thought. But this is to forget that the 'accurate expression of final generalities' which is its aim, is not the origin of the discussion but its goal, and this is achieved as a result of the discussion. Thus, philosophy has been misled by mathematics in this respect, for deductive logic has little certainty in its conclusion, without a firm foundation at its starting point.[2] This inhibits philosophy more than mathematics for mathematics commences from a firm foundation which is given.[3] The problem for philosophy is that it has been misled into thinking that it has clear and precise premises from which to begin its search. Actuality has the very opposite, unclear and uncertain foundation which are quite unsuitable for the development of logical deductions.[4]

Whitehead appeals to the evidence of Pythagorean tradition when it suggests that it was to a large extent the development of mathematics as a science based on 'abstract generality' that assisted the rise of European philosophy. Subsequently the primary deductive method of mathematics has been imposed onto philosophy whose method, as we observed, according to Whitehead, ought to be one of descriptive generalisation. This

1.PR p8, 2. MT p144, 3. PR p8,
4. PR p10. Wolfe Mays questions Whitehead's appeal to the assumption that we know that the 'harmony of logic lies open to the universe as an iron necessity'. (SMW p24) Such an observation is not based on empirical observation of any kind. Mays suggests that Whitehead has himself brought in the kind of assumptions used in mathematical logic and applied them in the field of experience of the cosmos. He accepts that it is reasonable to arrive at such a logical scheme by the substitution of the 'crude data of experience' by more 'logical entities'. The evidence suggests that Whitehead was fully aware that this was his method of procedure when he stated that the uniformity we ascribe to experience in nature does not belong to the crude data of experience, but is the natural result of a process of logical substitution. Mays describes this method of establishing the logical scheme as devised from a 'second order character'. (Wolf Mays, 1959 p70)

has prevented philosophy from contributing its generic notions to the debate, which could add clarity to the evidence of experience. Although deduction plays an important role in philosophy it is only auxiliary one.[1]

Prof. Emmet suggests that Whitehead was aware of the challenge of critical philosophers such as Kant, who questioned the connection between derived logical laws of reason and the universal laws of nature, when he complained that critical philosophy has driven a wedge between science and speculative reason. The result of the wedge is that philosophy has simply become a critical reflection on subjective experience, with science studying the body and philosophy the mind. For Emmet this can only mean that the followers of Kant did not have his awareness of the speculative side of science.[2] However, it is Whitehead's aim to place 'absolute idealism' onto a realistic footing through the recognition that the distrust of Speculative Philosophy is unjustified.[3] According to Whitehead, it is this speculative philosophical method which can really produce knowledge.[4] Following the establishment of rational life on earth and the establishment of language for the use of civilised people, Whitehead believes that the use of speculative philosophy is the next step in human progress, being no less efficient in this task than science itself. A major criticism leveled against speculative philosophy has been that it is over-ambitious. This charge is usually formulated in the context of examples of abandoned metaphysical schemes littered across Europe.

Thus, according to Whitehead, we should understand by 'Speculative Philosophy', something more than a merely casual speculation of random questions of interest of the moment. He believes there is a general consensus, that speculative ventures occur in the

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1.PR p10, 2.(Dorothy Emmet, 1966, pp42-44) 3. PR xiii, 4.PR p3, 5.PR p14,
But Whitehead suggests that on closer inspection there appears to be no greater number of these than there are of abandoned scientific schemes.[5] Even the well established laws derived by Newton from his observations, have had to be modified within the space of three hundred years through the advent of relativity. This should be an indication to us of the true situation regarding progress, derived from the single abstraction of Physics.[6]
6.PR p10.

sciences to a similar extent as those in the arts and in philosophy, and that in no area has this led to absolute success. However, our endeavors in both these areas are tentative and cannot claim absolute certainty.

According to A. D. Ritchie, although Whitehead has admirably emphasized the important involvement of speculative philosophy in many discoveries within science, he has at the same time underestimated the value of other forces, such as for example, the effects of attempting to satisfy practical wants. It was the need to establish longitude for mariners at sea that actually led to the construction of accurate watches for this purpose. The Greeks who had little need for such accuracy of instrument, had been satisfied with what their speculative reason could provide. They had been satisfied with: "...relatively inaccurate astronomical predictions and crude methods of observation, ...".[1] The designing of barometers and the air pump were the result of the need to pump water out of deep mines and to ventilate them, while the need to establish the trajectory of large missiles and handle large masses of metal for casting into artillery pieces may be regarded as discoveries and developments that would have occurred eventually, though probably less quickly.[2] Thus, according to Ritchie the account of reason offered to us by Whitehead should be understood as part and parcel of his wider metaphysical theory, as described in his Function of Reason.[3]

The third essential ingredient to Whitehead's philosophical scheme, with coherence and logic, is that it should be rational. This rationality involves it with speculative philosophy on the empirical side of the philosophy. This empirical side is described in terms of 'applicability' and 'adequacy'.[4] The need to include an empirical side essential to any metaphysical scheme which desires to be taken seriously, as illustrated by Aristotle's 'proofs for the existence of God. Being 'adequate' entails ensuring that in any instance,

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1. A. D. Ritchie, Whitehead's Defence of Speculative Reason, In: Schilpp, 1951, p329-349.p335
2. A. D. Ritchie, Whitehead's Defence of Speculative Reason, In: Schilpp, 1951, p329-349.p335
3. A. D. Ritchie, Whitehead's Defence of Speculative Reason, In: Schilpp, 1951, p329349.p341 4.PR p3.

the 'texture' of any observed experience which is chosen to illustrate a particular point of the scheme, must be of the same type, order or nature as other generally related experiences. This places a condition' on the scheme which binds it together. Through this universality of experience, clashes with other well-known 'matter of fact' experiences will be avoided. This becomes almost a doctrine of the necessity of universality which precludes information and relationships from outside the parameters of the experienced universe entering into the process to destroy it.[1]

According to Whitehead, it is in the empirical side of philosophy that the difficulty of establishing the metaphysical first principles has its origins. They originate from having only one universe to analyse with no possibility of making comparisons, for the normal method of progression is through the recognition of differences. This difficulty with empiricism occurs whenever we attempt to establish the larger generalities.[2] According to Whitehead the way forward is to employ 'imaginative rationalisation' which is the result of the recognition which alluded Francis Bacon, that natural science requires more than simple induction. But the imagination must be under the control of the same criteria of 'coherence' and 'logic'. This is the method which has the potential to succeed when empirical observation is not possible, even though it goes beyond the bounds of observation. If it is strictly operated it can be successful. The method must be under the umbrella of an accepted science such as physics, psychology, biology physiology or the like. The test to be applied to the imaginings will be their applicability, though even if it is deemed to be inapplicable in the discipline of its origin it may become a useful generalisation in other fields. Hence the first requisite is to proceed by generalisations.[3]

Schemes of science and philosophy are true only in relation to the general notions which they express and not to complex assertions. But such schemes cannot stand the stress of confrontation with the logic of questions as to whether the scheme is true or false. On that basis they will all be false. However, they will be made up of a matrix of propositions

1. PR p4, 2. PR p4, 3. PR p5.

which are true in particular circumstances. Such a matrix is all we have for the production of our logical arguments. But Whitehead believed that if a scheme is constructed with sufficient care and attention to detail, it can then be tested by the circumstances of the real world. This method is the one which avoids conflict with common sense. For Whitehead, Rationalism will always be an experimental adventure.[1]

In this scheme of speculative philosophy the term 'philosophic generalisation' stands for: "...the utilisation of specific notions, applying to a restricted group of facts, for the divination of the generic notions which apply to all facts."[2] Whitehead detects both rationalism and irrationalism in the way that natural science has utilised the notion of generalisation. In dealing with its own affairs it has been the former and with anything else, the latter. This is especially recognised in the way that natural science has made it dogma, that there are no factors in the world which cannot be fully expressed in terms of its own primary notions, from which there is no need of further generalisation.[3]

Arthur E Murphy agrees that most significant advances in the sciences as a whole, have at least commenced as a result of speculative adventures. But he draws attention to the fact that in Whitehead's speculative scheme, success or failure of a scheme is judged against the specific methods and claims of the philosophy as set out by Whitehead rather than according to a general scale of merit based upon degrees of speculation set against verbal orthodoxy, which might appear more suitable.[4] The method of speculative philosophy is similar to that of the sciences through its method of 'generalisation',[5] but in so far as it is in search of generalities that apply to everything that exists, and the definition of 'all facts' is restricted to the 'final' or 'ultimate' facts, it reveals a fundamental difference between itself and the sciences. It is as a result of this that speculative philosophy can formulate a single hypothesis which encompasses both the general and the concrete. However, as the nature of that 'concrete' is a fact of aesthetic experience,[6] and no final reality can be

1.PR p9, 2.PR p5, 3. PR p6, 4.PR p4 & 8, (See also the last Section, 12)
5. Arthur E. Murphy, Whitehead and the Method of Speculative Philosophy, Schilpp 1951, p356, 6. PR p427,

simply an abstraction, it is led away from science in a different direction.[1]

In contrast to the journey towards the larger generalities which is the study of philosophy, the special sciences deal with topics open to inspection by all: "The field of a special science is confined to one genus of facts, in the sense that no statements are made respecting facts which lie outside that genus."[2] This is largely the result of the nature of the derivation of the science from a set of facts generally accepted as connected. Within the framework of the science there is an inner satisfaction which has no need of other philosophies. They derive a degree of autonomy because of this acceptability and openness to public gaze. They shun metaphysics. However, the danger they risk, according to Whitehead, is that which befell Newton physics after its establishment and the acceptance of the notions and terms which developed with it. The subsequent re-interpretation and limitation of application of such laws of physics demonstrates the development of 'first principles'. Thus, we should perceive phases in the development and decline of generalities as the new appear and the old are qualified.[3] It is the task of philosophy to make sure that these generalities are challenged, for at such a stage of their development, the first scientific principles are in reality only half-truths. The method of making this challenge is to employ a generality which is distinct and separate from the specialist subject matter and which transcends it: "The systematisation of knowledge cannot be conducted in watertight compartments."[4] Further, on the basis of what is almost a premise of the philosophy of organism we should recognise that all general truths condition one another. Adoption of this role for philosophy would make it the source of a stream of new ideas in which philosophers themselves could participate.

However, Whitehead recognised that philosophy has its own weaknesses the chief of which is overstatement. This may result in the fallacy of misplaced concreteness,[5] or it may be based upon the certainty of logic.[6] Until the elaboration of categoreal schemes, stated clearly and definitely at every stage of development, is recognised as its proper objective,

1. Arthur E. Murphy, Whitehead and the Method of Speculative Philosophy, Schilpp 1951, p357.
2.PR p9, 3. PR p10, 4.PR p10, 5. PR p7, 6. PR p8.

philosophy will not regain its proper status. When this happens the purpose of research will be recognised as the task of relating the differences and inconsistencies in the rival schemes, each with its own merits and weaknesses, into a more amicable theory. It should always be borne in mind that metaphysical categories are not dogmatic statements of the obvious but are only tentative formulations of what are the ultimate generalities.[1]

A second challenge to Speculative Philosophy is the accusation of uselessness because it does not describe matters of fact. It is only from matters of fact that we can derive our laws, basing them strictly upon the limited detail of their systematisation. Whitehead's answer is clear and unequivocal: "Unfortunately for this objection, there are no brute, self-contained matters of fact, capable of being understood apart from interpretation as an element in a system."[2] This is to emphasise the doctrine that nothing is in isolation nor can it be understood in isolation. Everything requires the total system of its environment, the universal, in terms of which its particular definiteness can be expressed, in order to be understood. Universals, by their very nature, embody the characteristics of other facts within their own various types of definiteness. Hence the understanding of brute facts clearly requires a metaphysical interpretation.[3] Thus, there is in speculative philosophy a difficulty with individuality, for it is in tension with the totality. This is as a result of the subjectivism surrounding the individual consciousness which produces the single personal insight. This has to be integrated into the totality. High grade consciousness has contact with the totality simply by existing, but it has also developed its individuality and 'depth of being' by a process of selection based upon its own perspective. Thus another task for philosophy is to retain a concept of the totality obscured by selection.[4] Wolf Mays believes that if we are to do justice to Whitehead's Speculative Philosophy it is essential that we separate in our mind the difference between vagueness and generality, for Whitehead does emphasise general principles in his scheme while vagueness is a thing to be avoided: "So with Whitehead's philosophic scheme: its principles while general, cannot be termed vague, though we do not deny that his mode of expressing them may at times be disconcertingly obscure."[5]

1.PR p8 1, 2.PR p14, 3. PR p15, 4. PR p17. 5.(Wolf Mays, 1959, p52)

Summary

Metaphysics is an attempt to discover the general notions which lie behind everything that happens and is therefore concerned with the universal and ultimate fact. Its first premise was found to be the establishment of the nature of a complete fact. What is held in common with science is the attempt of metaphysical philosophy to understand things in terms of general principles. Further, the development of a metaphysical description of perception can also be expressed in the language of physics by a process of the substitution of particular critical words. Such examples illustrate that the general principles of physics are precisely those we would discover from a reconstruction of the metaphysics of the philosophy of organism. Thus, the failure of science to incorporate metaphysics into its analytical procedures, prevents it from challenging such paradoxes as that of the flux of creation and its permanences. Science was found to include metaphysics in its desire to find solutions to questions derived from its activity. Metaphysics demands three things; firstly, direct knowledge of events from which our immediate experience is composed, secondly, the need to harmonise any systematic accounts of different types of experience, and thirdly, to provide the concepts which will be the framework through which our epistemology can be expressed. The collapse of rigid empiricism leads us ultimately to the philosophy of organism.

Whitehead's aim was to formulate a coherent, logical, necessary system of general ideas in terms of which every element of our experience can be interpreted. This involves the conclusions of physical science, which includes the social functioning of humanity. In Whitehead's scheme, organism represents the activity at the centre of our philosophical cosmology. The characteristics of 'life' as appropriation and self enjoyment were considered. These were found to be manifest in lower organisms as 'proto-psychic' qualities, as the scale and scope of organisms was outlined.

Speculative philosophy is a specific method of investigation into the construction of a system of general ideas, such that every aspect of human existence can be investigated. It involves three major criteria which are those of being coherent, logical and rational.

Coherence is recognised as the basis from which every element of human experience can be understood. Hence, in the philosophy of organism 'coherent' means more than simply that the scheme itself is coherent. However there can be incoherence which would take the form of an arbitrary disconnection of principles or ideas, so that incoherence becomes tantamount to irrationality. To be logical simply means that there is consistency with no contradictions. It is from such a coherent, logical scheme that we can derive true knowledge. The third ingredient of 'rationalism', involves the empirical aspect of the philosophical scheme through the universality of experience. It is from the combination of experience and universality that the difficulties of establishing the metaphysical first principles and the larger generalities arise. Weaknesses inherent in philosophy demand the establishment of criteria for the operation of the philosophical scheme. Such weaknesses are 'overstatement' which leads to over-expectation and the deviation into proximate schemes of philosophy of a mystical nature. The inadequacy of speculative philosophy, through a supposed failure to describe matters of fact, is answered through the definition of coherence meaning the interpretation of a fact in relation to the totality of all other facts.

5) The Nature of Organism According to Whitehead

This section will concentrate upon the smallest fundamental unit of recurrence in nature, called by Whitehead the actual entity. Its constituents, 'prehensions' as 'feeling', 'eternal objects', 'God' and 'creativity', will be considered in turn in conjunction with the relevant doctrines of the genetic process of internal development in the formation of the actual entity, including the 'Subjective Form', the 'Subjective Aim' and the 'Ontological Principle'. Comments on Whitehead's use of language will be added where appropriate.

Introduction - Whitehead's Notion of Organism

In so far as Whitehead has applied the word 'organism' to physical and biological entities, in his description of atoms, molecules and ecosystems, for example, he has used it in a way recognisable from a biological description of an organism. Thus, his initial use of the term 'organism' appears to be in a general way which includes reference to both physical and biological entities. The word 'organism' is generally used to refer to the 'living', as distinct and separate from 'matter' and the inert, hence, organic matter possesses 'life' separate from inorganic material which is inert and passive. On this basis, Richard Dawkins describes living bodies as constituting 'physically discrete' machines i.e. single organisms such as human beings as individual organism, which are separated from other organisms, each having its own internal organisation. Such organisms have a single co-ordinated central nervous system.1

In the philosophy of organism the possession of 'life' is not the basis for the distinction between organic and inorganic material. An organism may be infinitesimally small or as large as the universe. The reason for this is that, according to Whitehead, everything is made of the basic and fundamental, smallest recurring unit of nature, which Whitehead came to refer to as the 'actual entity'. The actual entity is the basis of all existence in the actual world. First and foremost, according to Whitehead, this entity is a unity. Hence, the 'organic unity' is the first major notion to be considered in Whitehead's concept of organism, i.e. the operation of the relationship of the one to the whole through pattern and its reiteration.

1.Richard Dawkins, The Extended Phenotype, Oxford Universoty Press, New York, 1982, p250.

According to Whitehead, it is the interfusion of the aggregates which make the whole, in the process of the becoming of the actual entity, and which thereby constitute the nature of an organism. This interfusion does not mean simply aggregates coming together to form a new unit, while each retains its own individual identity within the unit. It is a more fundamental merging in which each contributor brings with it its own character, which, with the other aggregates, form a new unique entity which only that particular combination of aggregates could form through the characteristic each has provided. This unique characteristic is called by Whitehead the 'subjective form' of the new actual entity. Thus, according to such a non-materialist philosophy of nature, a primary organism is the emergence of a particular pattern formed into the unity of a particular entity.[1]

The formation, or 'concrescence', of the actual entity is a process of the interfusion of the eternal with the temporal.[2] Whitehead envisaged three elements being involved, the first the eternal in the form of eternal objects or pure potentiality, the second is the possible inclusion of the value associated with each of the eternal objects, and third the inclusion of some 'matter of fact' which is essential for any situation to have a future, for matter of fact relates to the temporal.[3] Whitehead refers to the basing of his philosophy upon the presuppositions of organism as traceable to Leibniz, whose first principle was that: "...the final real entity is an organising activity, fusing ingredients into a unity, so that this unity is the reality."[4] Thus, the notion of organism: "...depends upon the acceptance of internal relations binding together all reality."[5] Organisms are thereby the foundation of what 'is'. Thus, the organic unity is the operation of the relationship of the one to the whole through pattern and its reiteration. The entity is the result of two patterns of aspects, one as the new entity grasps the pattern of antecedent entities and the second as its own pattern is grasped by other entities. This is the sense in which there is a primary organism as the emergence of a particular pattern which forms the unity for a reiteration of pattern.[6] We should note that this grasping of aspects of a pattern, while excluding others, is more than simply a logical 'togetherness', for it is recognised as an achievement for its own sake.[7]

1.SMW p130, 2.SMW p129, 3.SMW p193, 4.SMW p132, 5.SMWp193.
6.SMW p129, 7.SMW p130.

'An achievement for its own sake'[1] means the taking up of a variety of elements into a real 'togetherness of pattern' based upon a common value. The introduction of such a notion of something having a property intrinsic to itself, according to Whitehead, requires an explanation:

> "Empirical observation shows that it is the property which we may call indifferently **retention, endurance of reiteration.** This property amounts to the recovery, on behalf of value amid the transitoriness of reality, of the self-identity which is also enjoyed by the primary eternal objects. The re-iteration of a particular shape (or formation) of value within an event occurs when the event as a whole repeats some shape which is also exhibited by each one of a succession of its parts."[2]

In the process of the grasping of the pattern of an antecedent entity, there is a modification resulting from the inclusion of the eternal valuation which is 'lured' into the pattern. The result is the dictum of the philosophy of organism that: "The concept of an organism includes, therefore, the concept of the interaction of organisms."[3]

In an hierarchy of part, or single aggregate, to organism, and an organism to other organisms, the acceptability of the notion of an ultimate unit of natural occurrence appears. The fact that biological organisms have ingredients, referred to by Whitehead as the smaller organisms of physics - by which we may understand he means electrons and other sub-atomic particles - leaves the question as to whether the smallest of particles is analysable into components which are smaller organisms. This is another way of asking whether there are such things as primary organisms. Whitehead's conclusion is that as nature would not prefer an infinite regress we are entitled to commence the search for an: "...ultimate unit of natural occurrence."[4] This unit would be concerned with all that 'is' and the relationship between all entities that 'are' would be part of the search.

Whitehead formulated a 'Categoreal Scheme' in which he envisaged 'Nine Categoreal Obligations' to explain the functioning of an organism. The first category of obligation relates to the incompleteness which ensues from the interfusion of the eternal with the physical. It explains that these diverse elements are compatible. The description of the eternal includes the notion of a conceptual feeling of valuation which introduces the notion of 'creative purpose'. According to the philosophy of organism, the physical

1.SMW p130, 2.SMW p130/31, 3.SMW p129/30, 4.SMWp193.

includes the 'feeling' of the eternal, the two being united in the ultimate unit of natural occurrence, the actual entity. This actual entity is conceived as being di-polar in nature, constituted by a mental and a physical pole. Thus Whitehead describes the actual entity: "It is the union of two worlds, namely, the temporal world, and the world of autonomous valuation."[1]

T.E. Burke describes Whitehead's philosophy of organism as, in effect, an unlimited generalisation of the notion of organism. Whitehead has applied it throughout the entire range of our concepts of being. Just as every cosmology to some extent generalises the notions it has borrowed from its various different sources, materialistic cosmologies borrowing from the realm of physics and idealism from psychology, so also the distinctive aspect of the philosophy of organism: "...is that its fundamental concepts derive from the realm of biology, the study of life in all its manifestations. Its essential thesis is that such concepts are instantiated universally, even in things that we would not ordinarily regard as organic like a stone pillar or a thinking mind."[2]

Whitehead described the philosophy of organism as a: "...cell theory of actuality. Each ultimate unit of fact is a cell complex, not analysable into components with equivalent completeness of actuality."[3] This cell can be understood both genetically and morphologically. It is in the genetic theory that the cell reveals itself as appropriating from the elements of the universe whatever it requires for its own creation. Each appropriation is called a prehension and what is appropriated are the physical elements of the already constituted actual entities and eternal objects. It is this process which will be considered next next.[4]

The Actual Entity

To characterise actual entities, in particular the interfusion of its aggregates from phase to phase, into a single unity, Whitehead introduced a series of new concepts, 'Prehension', 'Satisfaction', Superject', 'Objective Immortality' and the 'Ontological Principle'. These will now be described in some detail.

1.PR p248,
2.T. E. Burke, The Philosophy of Whitehead, Greenwich Exchange, London, 2000, p65.
3.PR p219, 4.PR p219.

For Whitehead 'actual entities' are the basic metaphysical building blocks of the universe, sometimes referred to as actual occasions. These are the final real things of which the world is made up. Generally the words 'actual entity' and 'actual occasion' are interchangeable,[1] the one exception being that the word 'occasion' implies a spatio-temporal location. God is an actual entity but is not limited by the constraints of spacio-temporality. Hence Whitehead's comment: "In the subsequent discussions 'actual entity' will be taken to mean a conditioned actual entity of the temporal world, unless God is expressly included in the discussion. The term 'actual occasion' will always exclude God from its scope."[2]

According to the philosophy of organism, there is only one genus of actual entity, but it includes a variety of species. Although there are gradations of importance and function among actual entities, all are on the same level in terms of the principles of actuality. They may all be described as a complex of drops of experience.[3] The term 'actual' is used to represent what is the 'res vera' of Cartesian philosophy, meaning 'existence in its fullest sense'. However, the Cartesian term excludes God's being, whereas in the philosophy of organism God is in the same generic scheme as all other entities.[4] 'Concrescence' is the term applied to the process of creation in which the universe of many things gains a unity. This relegates the individuality of each entity to a role of one in a unity of a new group.[5] Thus, concrescence is no more than the description of the real internal constitution of actual entities and the absorption of the aggregates into a single unity.3

According to Whitehead, an actual entity may be described as:... "an act of experience arising out of data".[6] The data for the objectification of any actual entity are other actual entities which are proximally relevant.[7] These are felt by the actual entity in the process of concrescence.
Thus, the process is one of 'feeling' the many data, in order to absorb them, or part of them, into the unity of the new individual entity. Here 'feeling' describes the generic operation of a passing on from the 'objectivity' of the established data, to the subjectivity of the new actual entity. Feelings do away with the 'neutral' and 'passive' stuff, or 'matter', of materialistic philosophies, for the actual entity cannot be described in such terms.[8] Thus, the word 'feeling' is used to describe the way in which the universe, as a complex of 'feeling', is available for the formation of an actual occasion, which is the ultimate creature.[9]

1.PR p77, 2.PR p88, 3.PR p19, 4.PR p74/5, 5.PR p211, 6.PR p212, 7.PR p40, 8.PR p190, 9.PR p40.

Whitehead declares that the word 'feeling' is a 'mere technical term' chosen to describe the way in which the process of concrescence functions, allowing the actual entities to appropriate the datum and make it their own.[1] The datum is elements of the universe being appropriated, which are different from the new subject but which are absorbed into it by being synthesised into the constitution of the new subject, which then has a new emotional pattern of its own. This constitutes the subjectivity of a new subject, for every new subject has its own unique subjectivity.[2] Thus 'feelings' may be described as 'vectors' because their role is feeling what is 'there', and transposing it into what is 'here'.[3] It is this subjectivity which becomes the 'subjective form' of the new actual entity.[4]

Because Whitehead's is a cell theory of actuality, the actual entity is the 'unit of fact' and the concrete reality of the actual world, for none of the components of the cell can be analysed into meaningful concepts without the other constituents of the total complex. Considered genetically the cell reveals itself as appropriating the elements of the universe out of which it is arising for the formation of its own structure. Each act of appropriation of an element in the construction of an actual entity is called a 'Prehension'.[5] The choice of the word 'prehension' is in order to express the activity in which an actual entity achieves its own concrescence from the availability of other entities.[6] 'Concrescence': "... is the real internal constitution of a particular existent."[7] The whole reason of an actual entity is to prehend.[8] Hence, the notion of a 'prehensive unification' is at the heart of the uncognitive mode of perception and the notion of the prehensive unification of volume.

1.PR p190, 2.PR p164, 3.PR p275,
4.PR p211/12. The 'Subjective Form' of the actual entity is derived from the way in which the prehension of the actual entity, in process of its own act of concrescence, feels the prehension of the antecedent actual entities. It becomes the form that it does, i.e. it develops its own specific definiteness, on account of the influence of the prehensions of eternal objects, which have also been 'lured' into that particular concrescence. Thus, the subjective forms of prehensions involved in the concrescence do not participate randomly but are attracted by a certain commonality with each other. Collectively they then establish the form of the total concretion: "There are many species of subjective forms such as emotions, valuations, purpose, adversions, aversions, consciousness, etc." (PR p184) Donald Sherburne illustrates the way in which the same datum may be received by different subjects in different ways in the example of the different responses a mother and an elderly neighbour who is a spinster mat respond to antics of an over-enthusiastic child: "Valuations are the subjective forms of conceptual feelings, and are either valuations up (adversions) or valuation down (aversion) (Donald W Sherburne, 1966, p245)
5.R p219, 6.PR p52, 7.PR p210, 8.PR p41
(The role of 'lure' and 'eternal objects' is described on Sides 124 - 128 of this Section)

Prehensions

Whitehead's doctrine of the actual entity concerns the becoming, being and relatedness of actual entities. Thus, to analyse actual entities into their most basic elements of concrescence, reveals them to be the concrescence of prehensions. These prehensions have themselves come into existence through the process of the becoming of the actual entity. Attempts at some form of analysis beyond this is analysis of prehensions, which demands reference back to, and analysis of, the actual entity from which its concrescence arose.[1] Three aspects are apparent in the activity of prehensions. The first is that of the prehending actual entity of which the prehension is a part. This actual entity is the initial datum of the prehension or feeling being described as a concrete element. The datum of a prehension is what is prehended or given. Anything which presents itself 'prior to', is datum.[2] The characteristics of an actual entity are governed ultimately by its datum. The datum has roles of both limiting and supplying, which form the basis of the doctrine that the characteristics of an organism are determined by its environment.[3] The second factor is the 'objective datum' of the actual entity. The initial datum is that which is being 'objectified' or selected for the entity in concrescence by one of the component feelings. The component feeling which does the objectifying is referred to as the 'objective datum'. The result of this objectification into an objective datum is the relegation of the objectified entity as a totality to at least a subordinate relevance in the role of establishing how that particular entity is a datum in the experience of the subject, for the role has been taken over by a single component in the objectified entity.[4] The objective datum has become the important component which becomes for the concrescing subject, its 'perspective' of the initial datum. The third factor is the 'subjective form' of the prehension, or the characteristic which decides how that subject prehends that datum. The particular subjective form is what it is, with its own particular definiteness, on account of the particular essences (eternal objects) that are part of its ingredients. In effect there are two actual entities involved, the first, associated with the factor of the initial datum, is the feeling or prehension; the second is the subject of the prehension where the prehension is the objective datum. The prehension in one subject becomes the objective datum for the prehension in a later subject.[5]

Thus, an actual entity is a concrescence of prehensions, where concrescence represents the process of the formation of an actual entity, and prehensions constitute the means by which new

1.PR p23, 2. PR p233, 3.PR p110, 4.PR p62, 5.PR p23.

actual entities are formed. Thus, our first conclusions concerning the actual entity are that it is a 'prehending' thing, in so far as its nature is its potential to participate in the process of concresence,[1] and second, all further analysis of actual entities becomes an analysis of prehensions.[2] However, we should distinguish between two types of prehension. Prehensions which are taken up into the new actual entity as subjective data are termed positive prehensions, while those which are rejected are described as negative prehensions. A positive prehension is the inclusion of the potential of that prehension into the internal constitution of the new subject. It is described as having 'feeling' for that item, thus, a 'feeling' is a positive prehension. Every actual entity in the actual world relates to some other particular actual entity as subject and is therefore felt directly by that subject, but to the rest of the world is felt only vaguely. This is described as the bond of each actual entity with the universe.[3] This bond applies equally to both types.[4]

A prehension is so called negative as a result of the rejection of the positive contribution it could have made to the subject's real internal constitution.[5] In spite of their rejection they still play a part in enabling the transition from the initial datum to the objective datum.[6] Thus a simple physical feeling: "... is the appropriation of some elements in the universe to be components in the real internal constitution of its subject."[7] These elements of the universe are the initial data in the first actual entity and are what the feeling feels. This suggests a clear distinction between the feeling and what is felt, which are the constituents of the feeling. Whitehead describes this as the feelings being felt: 'under an abstraction'.[8]

A simple physical feeling may also be referred to as a 'causal' feeling. It is the power of one actual entity over another and it can be applied directly to our understanding of the actual world.[9] Thus, the simple physical feeling plays a dual role in so far as it is both the feeling of the cause and the effect in the subject entertained by it. Whitehead refers to such a conditioned actual entity as 'the effect'. This is achieved through its nature as acting as a vector, in so far as what was the cause becomes the effect as it is transferred. The prehensive feeling does not suffer any loss of its original subjectivity in its transition from cause to effect. The simple physical feelings embody the reproductive character of nature as well as the objective immortality of the past, where 'objective immortality' means that of the datum of the antecedent actual entity which has been passed on to the concrescence of the new actual entity. Hence, the role of time in the concrescence is to bind

1. PR Pref. x, 2.PR p23, 3.PR p41, 4.PR p44, 5.PR p41, 6.PR p221, 7.PR p231, 8.PR p231, 9.PR p58.

the immediate present to the past. The present conforms to the past though it comes out of the past.[1]

The integrated nature of the feeling with the actual entity is emphasised by the doctrine that the feeling cannot be abstracted from the actual entity which is described as the 'subject' of the feeling. The feeling gains its identity by being part of the subject, is described as being part of its own subject and is a transition which effects a concrescence. It has a complex constitution which may be analysed into five different factors. These are:

> "...i) the subject that feels, ii) the initial data which will be felt, iii) the elimination as a result of negative prehensions, iv) the 'objective datum' which is felt, and v) the 'subjective form' which is how that particular subject feels that particular objective datum."[2]

Thus, the subjective aspect of an actual entity may simply be described as whatever the universe is for it.[3] This will include the reactions of the actual entity to the universe, which are the subjective forms of the feelings.[4]

In order to understand the role of 'eternal objects', a comment is necessary concerning the notions of 'novelty' and 'ingression'. Novelty represents the new or 'novel' component in the concrescence of the actual entity. The feeling is always new in relation to its data because its subjective form, although always having reference to the data regarding its reproductive role, is not wholly determined by the data. Hence, the subjective form is the immediate novelty of that particular concrescence, whereas the initial data and even the objective datum could have been involved already with other subjects. The subjective form cannot be separated from the novelty of its own concrescence. Thus, the subjective form may be described as the 'ingression' of novelty, on account of its unique fusion with the objective datum in that new particular fact. It is in this process of becoming that it encounters the data which are selected from the actual world.[5]

Whitehead defines ingression in the VIIth Category of Explanation as:

> "That an eternal object can be described in terms only of its potentiality for 'ingression' into the becoming of actual entities; and that its analysis only discloses other eternal objects. It is a pure potential. The term 'ingression' refers to the particular mode in which the potentiality of an eternal object is realised in a particular actual entity, contributing to the definiteness of that actual entity."[6]

According to Donald Sherburne the 'Platonic' sounding nature of the term ingression does not

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1.PR 237, 2.PR p221, 3.PR p154, 4.PR p24, 5.PR p233, 6. PR p23.

present a difficulty, for Whitehead had made it clear that eternal objects of the objective species are equivalent to the mathematical 'forms' of Plato.[1] The term is therefore approximately that of Plato's notion of participation.[2] Prof. Emmet refers to the term 'ingression' as an unfortunate one in so far as it implies something entering from outside, which is not Whitehead's intention in respect of his description of the activity as 'internal'. Her suggestion for a better understanding of the term is 'ingredient', which would overcome that difficulty. As a result of the association of 'ingression' with 'objects', she questions whether other alternative interpretations of the term might not prove to be more rewarding, but she concludes that on the basis of the general use of language used in 'Process and Reality' the Platonic view with its description of eternal objects as part of the category of existence should dominate.[3] 'Ingression' is the feeling of an eternal object by a given subject of the eternal object into that subject,[4] in which case it is neutral as conceptually felt.[5] Prof. Emmet expresses approval of Whitehead's choice of this word in so far as it represents: "...the entry of a form into the constitution of an actuality so that it becomes an 'ingredient' in it.", describing it as one of his happier terms.[6]

The Formative Elements - Eternal Objects

The term 'eternal object' in the philosophy of organism has been awarded a meaning sufficiently distinct to differentiate it from other notions of a similar nature in other philosophies. These, though similar, have slightly different emphases, as in the example of Plato and his 'forms', where, unlike the actual entity, 'form' does not participate directly in the process of creation itself.[7] Whitehead associated the notion of the ingression of the eternal object as an ingredient in the concrescence with Locke's phrase 'the real internal constitution' of things, which Whitehead represents as the qualities things reveal. These may be termed their 'essence.'[8] The term 'essences', used by Critical Realists, is theoretically suitable for the role of eternal objects, but the word has a specific and unique meaning which Whitehead did not desire.[9] Whitehead concluded

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1.(Donald W Sherburne, 1966, p221).
2. (Donald W Sherburne, 1966, p227).
3. Prof. Dorothy Emmet, Whitehead's View of Causal Efficacy, p164 In: Whitehead and the Idea of Process, Proceedings of the First International Whitehead-Symposium 1981. (Ed. H. Holz and E. Wolf-Gazo) pages 161-178. 4. PR p41, 5.PR p44.
6.Dorothy Emmet, Creativity and the Passage of Nature, In: The Proceedings of the Internationales Whitehead-Symposium, Bad Homburg 1983. P74.
7. This difficulty of the choice of a word sufficiently different from others of established meanings but not too distinctive as to be unrecognisable in the designated role is mirrored in Whitehead choice of the words 'prehension' and 'causal efficacy' as substitutes for Locke's term 'idea' as understood in modern philosophy, which Whitehead believed was too closely associated with 'subjectivity'. 8.PR p58, 9.PR p44.

that the word 'potential' alone would suffice as a substitute, for the eternal object is the pure potential of the universe.[1] Whitehead's description then becomes clearer: "Any entity whose conceptual recognition does not involve a necessary reference to any definite actual entities of the temporal world is called an eternal object."[2]

An eternal object conceptually felt is neutral in its physical ingression in any particular actual entity. Its potentiality includes the aspect of 'givenness', for there is a sense in which what is available as potential may not be taken up even though it is available.[3] According to Whitehead, these two terms in the philosophy of organism, 'potentiality' and 'givenness', are both meaningless if dissociated from the potential entities which are the eternal objects. Apart from potentiality and givenness the actuality of the process of the supersession of things by new things could not occur. The alternative to such an actuality is a static monistic universe. In such a universe 'potentiality' would be a meaningless term.[4]

The function of the eternal object is in its ingression into the creation of an actual entity.[5] Any analysis beyond this only reveals other eternal objects.[5] Although in an actual occasion, potentiality has passed into realisation, which removes all indetermination and all indecision, eternal objects have indecision as an inherent part of their character in so far as they are potentiality. Their ingression expresses the definiteness of the actuality in question, but the nature of the eternal object is such that it does not reveal in which particular actual entity the potentiality of ingression is realised.[6] Hence, in an ingression the eternal object retains its potentiality for an indefinite diversity of modes of ingression. As a result, a definite ingression into an actual entity should not be regarded as the 'sheer evocation' of the eternal object from 'not-being' into 'being'. It is in fact the evocation of determination out of indetermination: "Potentiality becomes reality; and yet retains its message of alternatives which the actual entity has avoided."[7]

Prehensions of actual entities are called 'physical' prehensions, those of eternal objects are referred to as 'conceptual' prehensions or feelings.[8] By analogy, a negative prehension is termed 'conceptual' when its datum is an eternal object.[9] A conceptual prehension or feeling, feels an eternal object in the sense that it feels its capacity for being a realised determinant of process. As such it is immanent, but as a capacity for determination it is transcendent. In both roles its

1.PR p149, 2.PR p44, 3.PR p44, 4.PR p45 5.PR p25, 5.PR p23, 6.PR p29, 7.PR p149, 8.PR p23, 9.PR p240.

relevance is in something other than itself.[1] There is no characteristic in actuality beyond that by which it is exclusively determined. Consequently, the definite nature of actuality is the direct result of the exclusiveness of eternal objects. The actual entity thus takes on this exclusive characteristic. Definite character is the result of incompatible alternatives. On this basis, a conceptual feeling or prehension is the feeling of the eternal object in relation to its capacity to determine character, which therefore also implies exclusiveness.[2]

Wolfe Mays also compares Whitehead's realm of eternal objects, particularly as described in 'Science and the Modern World', with that of Plato's realm of ideal forms, considering that realm to be a most puzzling concept. For example, the many characteristics of eternal objects are confusing in so far as they may be encountered in our own experience, perhaps of a colour, they may also be different characteristics of other events at other places and occasions, i.e. in any definite case of an exemplification of involvement of an eternal object. The same eternal object is not precluded from having a different relation on another occasion with a different occurrence. This characteristic is the reason for their designation as 'eternal', for they continue to recur in various modes. They can also be apprehended in abstract thought without any need for other exemplification being involved, i.e. they remain entirely abstract.[3] Mays highlights another title given to eternal objects by Whitehead in the same book when he refers to them as 'alternative possibilities. They are included in Whitehead's account of 'being and non-being'.[4] In this Whitehead is most concerned with their involvement in the realm of conceptual propositions in art, aesthetics and ideals as value.[5] Thus, the real puzzle according to Mays, is the ontological status which they have been given. They cannot be directly compared with the Platonic realm of ideas - in Whitehead's scheme eternal objects are dependent upon God and Creativity - yet they are associated with the objectivity of the actual world, the structure of which is entirely dependent upon them.[6]

Whitehead recognised that by establishing the role of eternal objects as pure potentiality he

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1.PR p239, 2.PR p240,
3. Wolfe Mays, Whitehead's Philosophy of Science and Metaphysics, Martinus Nijhoff, The Hague, 1977, p62 4.SMW p190,
5. Wolfe Mays, Whitehead's Philosophy of Science and Metaphysics, Martinus Nijhoff, The Hague, 1977, p63
6. Wolfe Mays, Whitehead's Philosophy of Science and Metaphysics, Martinus Nijhoff, The Hague, 1977, p64.

was introducing the same difficulty that faced both Plato and Aristotle and which faces all metaphysical philosophers, i.e. the relationship between pure potentiality and actuality. In the philosophy of organism the actualities which constitute the process of the world are regarded as exemplifications of the ingression into - or participation with - the world of actual occasions. Eternal objects constitute the eternal potential for definiteness which is what the creative process of the world demonstrates: "The things which are temporal arise by their participation in things which are eternal".[1] Hence, the temporal actual occasion can only arise on account of the participation of things eternal.

Donald Sherburne emphasises the importance of the role of the eternal object in the process of becoming. Actual entities are the data for concrescing subjects and the completion of the process is accomplished through the prehending of eternal objects, which as universals means that each entity is prehended by some element of its own definiteness.[2] The eternal object determines **how** the entities of the actual world enter into the concrescence of a new actual entity via its feeling.[3] Thus the prehension acts as a vector and carries what is 'there', transforming it into something which is 'here'. Eternal objects play an indispensable part in completing this transformation. This process invokes the Whiteheadian principle of 'relativity', which is deemed by Sherburne to be as important as the 'ontological principle'.[4]

According to Whitehead ,relativity describes the characteristic all entities have, i. e. of being an element in a concrescence with other entities. Everything in the universe of an actual entity is involved in its concrescence, i.e.: "... it belongs to the nature of a 'being' that it is a potential for every 'becoming'. This is the principle of 'relativity'."[5] It really establishes the fact that the notion of an 'entity' means: "...an element contributory to the process of becoming."[6] One of the main aims of the philosophy of organism is to make clear the notion of being present in another entity. The participation of one actual entity in the self-creation of another actual entity is the objectification of the first actual entity for the use of the second through its synthesis.[7]

The combination of these doctrines concerning the actual entity finds completion in Whitehead's

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1. PR p39/40, 2.PR p152, 3. PR p59.
The statements that all actual entities are connected, Whitehead's theory of Relativity, and that they are all on the same level, presents a problem which is considered in both Sections 10 and 11.
4.(Donald W Sherburne, 1966, p23). 5.PR p22, 6.PR p28, 7.PR p50,

'ontological principle'. At the heart of the philosophy of organism is the quest to establish what is the fundamental building block of our actual world, the essential thing. It reflects the Aristotelian idea that, apart from things that are actual, there is nothing. This is the central doctrine which Whitehead terms 'The Ontological Principle'. This states that any conceivable condition which conforms in some way or another to the process of becoming is explained either by the nature of some actual entity in a particular concresence, or that of the nature of the particular subject which is in the process of concresence:

> "That every condition to which the process of becoming conforms in any particular instance has its reason **either** in the character of some actual entity in the actual world of that concrescence **or** in the subject which is in process of concrescence. This category of explanation is termed the 'Ontological Principle."[1]

Thus, this doctrine states that ultimately the only reason for anything is an actual entity, so that the quest for a reason is a quest for one or more actual entities. Through the application of the ontological principle Whitehead insists that any explanation of the process of becoming, in the context of the world in which it finds itself, is to be found in either the characteristic of some actual entity in the actual world of that concrescence or in the nature of the subject which is in process of concrescence: "No actual entity, then no reason."[2] Hence, the necessary conditions which have to be satisfied by any one actual entity in its own process are expressing a fact, either about the 'real internal constitutions' of some other actual entities, or about the 'subjective aim' which is conditioning that process.[3]

Whitehead states that the ontological principle could be described as the principle of efficient and final causation.[4] This is to imply that it can explain both our immediate experience of creation and at the same time the ultimate purpose of creation. He regards his doctrine as simply broadening and extending a general principle formulated by Locke, where Locke insists that 'power' plays a major part in our ideas about substance.[5] Whitehead makes a direct substitution for Locke's 'substance' by the actual entity of the ontological principle.[6] The introduction of the 'subjective aim' brings us to the second of the 'formative elements' which is God.

According to Ivor Leclerc certain aspects of the role of the eternal object in the process of concrescence are best understood in the light of the ontological principle. However, the role of the eternal object is fundamental to the concrescence of actual entities, and so must in some

1.PR p24, 2.PR p19, 3.PR p24, 4.PR p24, 5.PR p18, 6.PR p19.

sense be antecedent to the actualities, hence their title, 'eternal objects'.[1] They are, as a form of definiteness, the other required components within the concrescence, though they are not themselves actual entities.[2] This confirms the uniqueness and distinctiveness of the eternal object within the actual entity itself. Their existence is eternal, but that of the actual entity is change and becoming, though they participate in the process of the becoming. They may be regarded as coming into existence to 'inform' or 'impart' to the actual entity, but not as new creatures for the definiteness of a form is eternal. They are the forms definiteness takes and as such are regarded as a fundamental type of entity. They are 'pure potential' for the determination of particular fact.[3]

God

The second formative element is God, the nature of which according to Whitehead,is threefold. Firstly, is the primordial nature in which God is mediator between the timeless potential of eternity and the temporal actuality of the actual world. In a way similar to that suggested by Ivor Leclerc for understanding eternal objects, Donald Sherburne suggests that the notion of God is also best understood through the application of the ontological principle.[4] Thus we are directed to Whitehead's argument that it would be a contradiction in terms to accept on the one hand that, through the ontological principle, everything is both 'actual' and 'somewhere', while at the same time suggesting that it is reasonable to expect some kind of solution to a particular question, to pop up from anywhere.[5] Any explanation of fact has to belong to the efficacy, i.e. what it brings with it and the decisions of the actual entity which are achieved through its prehensions.

According to this argument, because the universe demonstrates relatedness to actual entities. the potential of the origins of the universe must also be somewhere. This somewhere is a non temporal actual entity. God has been given the role of mediating between temporal actuality and timeless potential, the latter being what Whitehead refers to as 'the divine element in the world'.[3] It is the divine element which enables the random inefficiency of abstract potential to become the actual world of matter, with all that is implied about the limitations of one conjoined unit. Thus, according to Whitehead, philosophy of organism is confirmed as a philosophy of both concrescence and atomicity.[7] Its doctrine states that it is not possible to understand eternal

1.Ivor LeClerk, Whitehead's Metaphysics, An Introductory Exposition, George Allen & Unwin Ltd. 1958, p91-95, 2.MT 126/7.
3. Ivor Leclerc, The Philosophy of Whitehead, George Allen and Unwin Ltd., 1959, p74-75
4. (Donald W Sherburne, 1966, p25)
5.Ivor LeClerk, Whitehead's Metaphysics, An Introductory Exposition, George Allen & Unwin Ltd. 1958, p94. 6. PR p60, 7.PR p46.

objects in isolation as an abstraction from the actual world, for that would be to reduce them to mere 'undifferentiated nonentities'.[1] As a consequence their conceptual realisation in the primordial nature of God is essential for the revelation of their differentiated relevance to each instant of the creative process. The relationship of diversity and the pattern eternal objects have to each other, are in fact their relationships within God's conceptual realisation.[2]

The question of the relevance of 'unrelated non-entities' directs attention to the nature of relevance. If 'relevance' is the expression of a real aspect of togetherness among the diversity of forms, then the ontological principle may be expressed as: "All real togetherness is togetherness in the formal constitution of an actuality."[3] Consequently, to accept the relevance of things which are unrealised in the temporal world is an expression of a belief in the togetherness of a formal constitution of a non-temporal actuality. Applying the principle of relativity as understood in the philosophy of organism, there can only be one non-derivative actuality, which will be unbounded by its prehensions of an actual world.[4] According to Whitehead, in one universe there can only be one example of 'unfettered conceptual valuation' because it is undeniable that the creative act is a once and only act establishing its consequences for ever.[5] It is in such a primordial being that creativity achieves its goal, which is: "...the complete conceptual valuation of all eternal objects".[6] This is to establish the fundamental togetherness of the eternal objects on which the whole of the creative order depends. It establishes the relevance of all appetites, it constitutes the meaning of relevance and it gains a status as an actual efficient fact by awarding it the term 'primordial nature of God'.[7]

Whitehead explains 'appetites' in a doctrine of 'Appetition'. The doctrine relates the urge forward to the conceptually prehended datum that is inherent in the conceptual value of an immediate physical feeling.[8] This doctrine appeals to the IVth Category of Obligation which states that: "From each physical feeling there is a derivation of a purely conceptual feeling with data which are partially identical with, and partially diverse from, the eternal objects forming the data in the first phase of the mental pole. The diversity is a relevant diversity determined by the subjective aim."[9] This valuation is either valuation upward (adversion) or valuation downward (aversion) Thus appetition: "...is immediate matter of fact including in itself a principle of

1.PR p257.
2.PR p32, (See Sections 10 and 11 for comments on the implications of this relatedness)
3.PR p32, 4.PR p32. 5PR p247, 6.PR p32, 7.PR p32, 8.PR p32, 9. PR p26.

unrest."[1] Most important is the connection of appetition with the primordial nature of God where 'nature' refers to an "...unfettered conceptual valuation, 'infinite' in Spinoza's sense of the term" derived from the realm of eternal objects.[2]

It is as a result of the establishment of this primordial valuation of pure potentials that each eternal object has its own particular relevance to each concrescent process. Without this, novelty would be meaningless and inconceivable, because of the disjunction of eternal objects unrealised in the temporal world.[3] In every concrescence there is always a definite relevance derived from God resulting from this complete valuation: "Thus, possibility which transcends realised temporal matter of fact has a real relevance to the creative advance."[4] According to Whitehead, the divine ordering which conditions creativity is termed 'God' because our human nature, which includes the experience of feelings from the source of eternity, acquires its own 'subjective form' which receives replenishment from sources such as those offered by religions.[5] However, the subjective form alone is insufficient to establish continuity.

The role of God as the organ of novelty includes the aim of intensification.[6] In order to achieve the intensification, God has a 'lure' for feeling which is an eternal urge of desire. The primary element of the lure of the primordial nature of God is in the subject's prehension.[7] The particular relevance of the subject's prehension as it arises from its own standpoint in the world, constitutes for God the initial 'object of desire', thereby establishing the initial phase of each subjective aim.[8] There would be nothing new in the world, nor would the world have order, without the intervention of God. Creation would be ineffective with incompatibilities being dominant. It is the novel feelings which are derived from God which are the basis of progress.[9] Hence in this conception, God is the urge towards novelty, as well as the foundation of order and the outcome of creativity - in God's consequent nature. God's subjective aim uses 'Order' and 'Novelty' as the instruments to achieve the intensification of feeling in the immediacy of concrescence. The purpose of God in the creative advance is the encouragement of intensities.

Combining the notions of 'value', 'lure' and 'aim' together, we are directed towards the final condition of the actual entity which is 'satisfaction'. The description of satisfaction completes the

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1.PR p32, 2. PR p247, 3.PR p24, 4.PR p24, 5.PR p19. 6.PR p67, 7 .PR p189, 8.PR p344, 9.PR p247.

general explanation of the process of becoming of the actual entity. The phases have concluded in an integrated complex of feeling of that occasion's actual world, which is the satisfaction of the actual entity. "The satisfaction is the culmination of the concrescence into a completely determinate matter of fact."[1] Thus, with satisfaction, the process is at an end and the actual entity transcends the realm of concrescence into that of 'objective immortality'. It has become an addition to the quality of definiteness which is attainable in the world.[2] Transcendence here means in the completion of its becoming, in which it has made a contribution to the actual world and thereby entered a future beyond itself. This makes it something greater than it was alone, in its own satisfaction.[3] Considering the notion of the objective immortality of the actual entity, is to analyse it morphologically or 'objectively', considering it in relation to the culmination of its process of completion. To consider the actual entity 'formally' is to concentrate on its functional aspects, whereby the process of concrescence is immanent in the actual entity: "The 'formal' reality of the actuality in question belongs to its process of concrescence and not to its 'satisfaction'.[4]

Whitehead again associates his philosophy with that of Locke in describing the 'satisfaction' of the actual entity as including what the actual entity is beyond itself, for the 'powers' of an actual entity are: "...definite, determinate, settled fact, stubborn and with unavoidable consequences".[5] Although the internal process of the actual entity, which is its formal or functional aspect, has ended with satisfaction, its effects, which are its 'interventions', will be felt in the continuing process of concrescence of other actual entities. Such an entity is regarded as functioning as an object, hence the introduction of the term 'Objective Immortality'.[6] It is common for all entities to function as objects and it is this metaphysical characteristic which is the solidarity of the universe.[7]

According to Whitehead, the characteristic of an actual entity in influencing its own becoming at every stage, has to be considered in conjunction with the role of the actual entity as an atomic creature whose function is objective immortality. Having become an object, it is a being, the nature of which, for all beings, is to be a potential for every other becoming.[8] This doctrine is based on the fact that to be actual, is for all alike to be an object, all of which experience the role of objective immortality in their influence on creativity. Thus all actual things are subjects which

1.PR 212, 2.PR p223, 3.PR p230, 4.PR p220, 5.PR p219, 6. PR p220, 7.PR p219, 8.PR p45.

prehend the universe from which they have arisen.[1] Hence, an actual entity is at one and the same moment a subject experiencing, and also the superject of its own experience. This doctrine is diametrically opposed to any notion of an actual entity as an unchanging subject of change: "It is subject-superject, and neither half of this description can for a moment be lost sight of."[2]

The notion of 'superject' means that a subject combines both of these characteristics, of the process of becoming with the totality of what the becoming is on completion, i.e. its satisfaction. Only in the completion can the actual entity be regarded as an object. Hence, Whitehead uses the tern 'subject' in the familiar philosophical sense, when referring to the internal constitution of the actual entity, recognising that this could be misleading.[3] Whereas substance philosophies presuppose a subject as meeting a datum with which it then reacts, the philosophy of organism essentially reverses this procedure by presupposing a datum, which is then met by feelings, from which there is then a progressive attainment of the unity of the subject.[4] As a result, in the philosophy of organism we should always understand the word 'subject' to be an abbreviation for 'subject-superject'.[5]

The superject is the purpose of the process, which is the origin of the feelings. These feelings are inseparable from the goal at which they aim, which is the feeler: "The feelings are what they are in order that the subject may be what it is."[6] As a result of this, it is only through its feelings that the subject can objectively condition the creativity which transcends it, i.e. what is beyond itself. Thus, this doctrine in the philosophy of organism offers an explanation for the notion of moral responsibility in human beings, for the subject is responsible for what it is as a result of its feelings. There is also scope for the derived responsibility of the consequences of its existence, because these also flow from the subject's existence.[7]

In this doctrine 'relatedness' is dominant over 'quality' in so far as relatedness is between actualities, and this means the appropriation of the dead by the living. It implies that whatever has lost its living immediacy,[8] itself becomes a component in all other subjects in the immediacy of their becoming. This is the doctrine of the creative advance of the world which is the becoming, the perishing and the objective immortalities of all those things which jointly participate in stubborn fact.[9] The world is described as a process of the becoming of individual actual entities,

1.PR p56, 2. PR p29, 3.PR p222, 4.PR p154/5, 5. PR p29. 6.PR p222, 7.R p222, 8.PR pPref.xiii. 9.PR Pref. pxiv.

each entity having its own absolute self attainment.[1] Whitehead reduces the finality of its completion in satisfaction to nothing more than a decision referred beyond itself. Thus the 'perpetual perishing' of individual absoluteness is a given, which is part of the process. That is also the attainment of objective immortality.[2]

Prof. Emmet finds some difficulty with several of the concepts within this description, for example, her major concern is with the doctrine that God is the first, primordial, non-temporal actual entity. Although there is only one genus of actual entity, there is a graduated scale of importance, and God is not to be treated as an exception to any metaphysical principles.[3] Thus, according to Prof. Emmet, this presents a need to resolve the division of roles between eternal objects and the primordial nature in creativity. However, this leads us to the difficulties recognised earlier by the application of the ontological principle, for if everything has to be somewhere this must also apply to eternal objects, as the potential of the universe must be somewhere. Eternal objects retain their general potentiality for actual entities which are not realised, finding their potentiality, or 'proximate relevance', in the non-temporal actual entity which is the primordial nature of God.[4]

Creativity

The third formative element and part of Whitehead's Category of the Ultimate is 'Creativity'. With the notions of 'many' and 'one' we interpret the terms 'thing' 'being' and 'entity'. Creativity should be recognised as a distinct formative element, separate from God and eternal objects. It has its own importance in the manifestation of itself as the creative advance of the world. These three together presuppose the three categories in the categoreal scheme, of 'existence', 'explanation' and 'obligation'.[5] The relatedness of things is based upon the relatedness of actual entities. Such relatedness is totally concerned with the completed actual entity as 'objective immortality', being appropriated by the new actual entities in the process of concrescence. Thus it is the result of the completion of the concrescence of the actual entity culminating in satisfaction and the subsequent achievement of objective immortality that the actual entity becomes a real component in the immediacy of the new becoming: "This is the doctrine that the creative advance

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1.PR p60, 2. PR p60, 3.PR p343,

4. Dorothy Emmet, Whitehead's View of Causal Efficacy, In: Whitehead and the Idea of Process, First International Whitehead-Symposium, 1981, Ed. H Holz and E Wolf-Gazo, p172.
This, and other examples of Prof. Emmet's concerns with the relationship between God and Eternal Objects, which implicates the Ontological Principle, will be considered fully in Chapter 3 Sections 10 and 11.

of the world is the becoming, the perishing, and the objective immortalities of those things which jointly constitute stubborn fact."[1] In this case stubborn fact means actual entities.

Whitehead insists that in every philosophical theory there is something which is ultimate and of which we are aware because of what is actual, which he refers to as 'accidents', i.e. the ultimate can only be recognised as a result of the 'accidental embodiments' with which they are associated.[2] Apart from these embodiments the ultimate is not recognisable. The ultimate in the philosophy of organism is what is designated by the word 'creativity', its primordial non-temporal accident being God. In a monistic philosophy such as that of Spinoza, the ultimate is God the terms being synonymous. According to Whitehead, this is an illegitimate application of the final 'eminent' reality for the accidents of the ultimate by which the ultimate is known should be distinguished from the ultimate itself. In the philosophy of organism this is the case, for creativity is not an external agency having its own independent purposes. Process is the ultimate.[3]

Whitehead describes creativity as a different form of Aristotelian 'matter', Aristotle's concept being stripped of the associated notion of passive receptivity in either form or external relations. It is the pure concept of activity, but conditioned in the philosophy of organism by the concept of the objective immortality of the actual world, which means that the actual world never repeats itself exactly, although it does also contain the stability of a higher order. Creativity is a process with no nature of its own other than that demonstrated by its association with the objective world. This provides it with a recognition derived from particular circumstances and conditions. Because it is the most general and least specialised entity, it is free from 'passive receptivity' in either the form it takes or its external relations. Whitehead has applied the word 'God' to what he describes as: "... the non-temporal act of all-inclusive unfettered valuation".[4] This is simultaneously both the product of creativity and the provider of the conditions for creativity. According to Whitehead, in so far as the nature of the actual entity is to feel what it feels in order to be what it is, it conforms to Spinoza's notion of substance, whereas God is regarded as part of the basic structure which is the actual world. God is the first creature of creation. In so far as all actual entities, including God, are formed through self-causation, they also share with God the characteristic of transcendence.[5]

This description presents us with two basic doctrines of the philosophy of organism regarding

1.PR p21, 2.PR Pref. xiv. 3.PR p7, 4. PR p31, 5. PR p222

creativity. One is that creativity is not an external agency with its own independent powers and the other is that creativity must be able to account for the perpetual advance into novelty. Creativity is the principle of novelty because an actual entity is in itself a novel creation different from any other entity of the 'many', though it unifies the 'many' within itself.[1] The terms 'creativity', 'many' and 'one' are the terms which represent the ultimate concepts which we use in understanding the synonymous terms 'thing', 'being' and 'entity'. The idea of the 'many' presupposes that of 'one' and vice versa. The term 'many', which represents what Whitehead refers to as a 'disjunctive diversity', is an essential element in the concept of being for creativity introduces novelty into the 'many' which make up the disjunctive universe.[2] The creative unity of the universe is revealed in the process of self experience of the actual entity, adding to the multiplicity of the universe of the many.[3] Creativity is also the ultimate principle by which the universe of the many separate entities, the 'many' become the one actual occasion, which is the universe conjunctively. Creativity is the doctrine in the philosophy of organism which states that it is in the nature of things that the many unite to form complex unities: "In their natures, entities are disjunctively 'many' in process of passage into conjunctive unity."[4]

It is not possible for things described as the 'many' not to be part of, and subordinate to, the unity of a totality of a concrete whole.[5] A unity of actual occasions is the standpoint for a new and different concrescence which creates its own unity from those actual occasions: "It is inherent in the constitution of the immediate, present actuality that a future will supersede it."[6] This is to say that any relatively complete actual world is the datum for a new concrescence and this process is termed 'transition'.

Thus, in his description of the advance from disjunction to conjunction, creating a new entity different from the entities from which it arose in disjunction, Whitehead has established what he describes as 'the ultimate metaphysical principle'.[7] This may be expressed as the world expanding by the addition of itself to itself, through the recurrence of a series of unifications which recreate the whole multiplicity again from which the new unity can arise.[8] The new novel entity is simultaneously both one among a new togetherness of the many in which it finds itself conjunctively, while it is also an entity disjunctively from those entities which it leaves in becoming a novel entity: "The many become one and are increased by one".[9] According to

1.PR p21, 2.PR p21, 3PR p57, 4.PR p21, 5.PR p211, 6.PR p215, 7.PR p21, 8.PR p286,

Whitehead, this incompletion represents the basic characteristic of nature as it strives to go forward. Its constant 'going beyond itself' represents the creative advance of nature.[1] Whitehead describes the process as 'rhythmic' swinging between the collectivity of the many to the private intimacy of the individual thing. This metaphysical interpretation incorporates the notion of efficient causality in the swing from the single 'one' to the many, and final causation in the movement from the 'many' to the one. This is the reality of the creative advance of the actual world from which Whitehead saw no escape.[2] This association of creativity and the final cause establishes the role of creativity with the foundations of the world and its order.

Donald Sherburne describes Whitehead's account of creativity in Process and Reality as an: "...elusive but crucial concept" and one which is: "...terse to the point of obscurity".[3] Yet it is the concept which accounts for 'the creative advance into novelty'. With such a role it is the cornerstone of Whitehead's process philosophy.[4] He notes an incompatibility between the two fundamental ideas, the first one of a system which is attempting to make the many into the one, and the second which is an association of the system with a move towards novelty. The single entity which is a 'one' is formed from the many and is novel, and separate and diverse from the rest of the universe. This implies that the process described as the many becoming the one, will continue to eternity. This may be a daunting prospect as it raises questions of beginnings and endings.

Sherburne also suggests that this is not quite the same doctrine as is implied in Modes of Thought, where the 'rhythm' of the process is the actual entities as historical fact, which he believes are all alike, alternating between the 'one' and the 'many', simply in repetition.[5] According to Sherburne, the account in Process and Reality presents no conflict with the ontological principle. Creativity is what Whitehead describes as the 'universal of universals' which is the characteristic of matter of fact, and the description of the nature of actual entities.[6] This understanding of the ultimate principle describing the relationship between the 'one' and the 'many' is the creative process of new actual entities. It emphasises that between the 'one' and the 'many' is the creative process of new actual entities and that they are neither separate from nor independent of each other so that the 'advance' associated with the creation of new actual entities results from their dependence

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9.PR p21. 1.PR p289, 2.PR p151,
3.(Donald Sherburne, 1966 p32) 4.(Donald Sherburne, 1966 p33)
5.MT p120, 6.PR p31.

on each other. What is to be taken up in the new actual entity is the major ingredient, or initial datum of the prehension at the base of all temporal actuality.[1]

Prof. Emmet observes that the two most central ideas in this doctrine of creativity are, first, that creativity must not be considered as something different and separate from the process of the actual world with its own distinct purposes, for this would violate the ontological principle, and second, that creativity is the concept which has to account for the continual advance into newness which is observed in the actual world.[2] It can be called a 'universal' even though it is not itself a thing, for it exists as manifested in matters of fact which are themselves the 'synthesis', which is the process which makes up the world. Creativity is not temporarily prior to things produced as creatures and it is not a predicate for everything measured by an 'existential quantifier' such as eternal objects. It is the universal of universals, i.e. the one thing that is part of all universals.[3]

Prof. Emmet also observes that even if we do describe the fundamental nature of creativity as the passage of nature, and include within that the concept of 'extensive connection', it would not provide us with a description of the creative advance into novelty to which Whitehead has referred. Creativity needs 'appetition' which Whitehehead includes as a characteristic of the primordial nature. She regards the basic teleology as being in creativity itself, for the process concerns more than just events, unless the nature of an event also includes the idea of action within it. She doubts whether Whitehead fully realised the magnitude of the nature of the switch from an ontology of events in his earlier works, up to Science and the Modern World, to one of actual entities in Process and Reality.[4] If we are to retain the idea of the process of creation with that of the 'one' and the 'many' in the designation of the ultimate, we are retaining the doctrine of continuous creation of new syntheses. It is because this process is an active one that it was able to develop into a philosophy of organism. The transition can be seen as having begun with such references by Whitehead to: "...a substantial activity expressing itself in individual embodiments, and evolving in achievements of organism".[5] It is in fact the development of Whitehead's terminology which reveals 'creativity' to be a combination of the terms 'category of the ultimate' and 'one' and 'many'. As such it represents the possibility of the

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1.(Donald Sherburne, 1966 p35)
2. Dorothy Emmet, Creativity and the Passage of Nature, In: The Proceedings of the Internationales Whitehead-Symposium, Bad Homburg 1983. p71.
3.Dorothy Emmet, Creativity and the Passage of Nature, In: The Proceedings of the Internationales Whitehead-Symposium, Bad Homburg 1983. P72, 4.PR p225, 5.PR p343.

formation of complex unities which prevent the world being simply 'an assembly of disjuncts'. Whitehead calls that which provides the possibility of order out of disorder, and provides the initial ordering, 'the primordial nature of God'. But he also refers to it as the envisagement of all possibilities. Prof. Emmet finds this 'envisagement of all possibilities' extremely difficult to imagine. To conceive of something, whether it is actual or not, which is everything that happens or might happen, is incomprehensible. She describes as unhelpful the notion of God as involving an indefinite number of hypothetical possibilities which rely upon opposing factual conditions, suggesting as an alternative that it may be more helpful to conceive of the Primordial nature of God as involved in the ordering of the creative drive of the universe. In this way a clearer explanation of the ordering of different roles is achieved.[1]

Three conclusions drawn by Prof. Emmet on Whitehead's doctrine of 'Creativity' are important in our present considerations. The first is that we are right to connect creativity in Process and Reality with the 'passage of nature' in Whitehead's earlier works. The second is that creativity is understood in a process in which there are genuine transmissions and not simply transitions i.e. not only 'passings on' but also 'pickings up'. The genuineness of the 'passings on' is confirmed in reflections of our own experiences which include derivation and anticipation. The third is that the stress on 'creativity of activity'[2] can be seen as being in accord with what Whitehead said in Science and the Modern World when he spoke of the 'substantial activity at the base of things.[3] We should therefore not expect to see the passage of nature as 'atomised' in the earlier works, as we do in later books.

According to Leclerc, Whitehead did not adopt the position of the Neoplatonists of a single source of creation to account for all that is, but rather reverted to the position of Plato and Aristotle, that of a threefold source of the ultimate.[4] The becoming of the actual entity reveals a certain order through its definiteness, form, pattern and character, but the Whiteheadian understanding of the word 'order' requires consideration of its opposite, 'disorder'.[5] There is also underneath or behind the process, an activity of 'creativity'. The question is whether this

1. Dorothy Emmet, Whitehead's View of Causal Efficacy, In: Whitehead and the Idea of Process, First International Whitehead-Symposium, 1981, Ed. H Holz and E Wolf-Gazo, p171.
2.PR p43, 3.SMW p152,
4. Ivor Leclerc, Process and Order in Nature, In: Whitehead and the Idea of Process, Proceedings of the First International Whitehead Symposium, Ed: Harold Holz and Ernest Wolf-Gazo,1981, p135,

creativity is also the source of its own definiteness. Leclerc notes Whitehead's association of his notion of creativity with that of Plato and Aristotle, where creativity does not have a definiteness of its own and cannot be regarded as the reason for the order. He finds Whitehead's 'creativity' more akin to Plato's 'Receptacle' of 'Form', as the 'realm of eternal forms' of his later position, expressed in the Timaeus as 'principles of becoming'. Thus, Whitehead agrees with Plato that some other, different principle is necessary to explain 'definiteness'. Similarly, Aristotle refers to the forms as one of two principles, of which for Aristotle the other is matter. Leclerc concludes that, in so far as Whitehead refers to two principles of the formative elements as first, the creativity through which the actual world of temporality progresses to novelty, and second, the realm of ideal forms, (eternal objects) which though not themselves actual are exemplified in all that is actual, he is at one with Plato and Aristotle. However, Whitehead recognised that these two principles alone are not able to account for the reason of definiteness for they do not explain why any one form of definiteness should prevail over another. A third principle is required which is the principle of concreteness and this is given to the primordial nature of God:[1] "That is, for Whitehead, God is the principle, source, of the 'end', 'aim', necessary to an actual being to attain a determinate 'concretion'. This is the conception of God, as Whitehead states, as the 'principle of order'".[2]

Wolf Mays believes that Whitehead devised his role for eternal objects under the influence of Platonic philosophy. However, Mays links eternal objects directly to the primordial nature of God.[3] He notes inconsistencies and vagueness in Whitehead's presentation of the role of the Deity between his earlier and later works, allowing Whitehead to link both eternal objects and God to the extensive continuum through his description of it, in terms of Plato's 'receptacle'. These three all appear to relate to what Mays describes as: "...the same general system of undetermined relationships"[4] in the order of nature. He agrees that the association of the deity

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5. Ivor Leclerc, Process and Order in Nature, In: Whitehead and the Idea of Process, Proceedings of the First International Whitehead Symposium, Ed: Harold Holz and Ernest Wolf-Gazo,1981, p133.

1. Ivor Leclerc, Process and Order in Nature, In: Whitehead and the Idea of Process, Proceedings of the First International Whitehead Symposium, Ed: Harold Holz and Ernest Wolf-Gazo,1981, p134.

2 Ivor Leclerc, Process and Order in Nature, In: Whitehead and the Idea of Process, Proceedings of the First International Whitehead Symposium, Ed: Harold Holz and Ernest Wolf-Gazo,1981, p135,

3, (Wolfe Mays, 1959, p58) 4. (Wolfe Mays, 1959, p57)

with 'undetermined relationships' may at first appear to be strange in the light of such Whiteheadian descriptions of the Deity in terms of the 'concrete', which in Whitehead's philosophy implies experience. But according to Mays, Whitehead is really speaking about structure in a mathematical sense, i.e. as a set of relations, as for example in Whitehead's reference to God as the: "... unconditioned actuality of conceptual feeling at the base of things."[1] This clouds further the abstract nature of his account. Thus, the descriptions of each has to be balanced by descriptions of the others.[2] What is clear is that although the deity is the ordering entity in nature, the conceptual feelings of the primordial nature of God are without any experiential content. As the ordering entity, God is not burdened with theological constraints but is also associated with the morphological scheme which involves eternal objects.[3] Thus we are presented with a theory of extension of a most generalised kind and it is this which forms the basis of nature. Thus, Mays concludes that: "There seems little doubt that 'the morphological scheme involving eternal objects of the objective species' is the same concept as the 'Primordial Nature of God.'"[4] Eternal objects have become merely a part of one great totality of the eternal. According to Mays, the similarity of the primordial nature and eternal objects is supported by the Whiteheadian description of eternal objects as the 'mathematical platonic forms', and that, as in the primordial nature, they constitute the platonic world of ideas,[5] Whitehead regarding this world as a: "...refined, revised form of the Pythagorean doctrine that number lies at the base of the real world".[6] Mays' conclusion is that in this context Whitehead is using 'Platonic idea' to refer to his own notion of extensive pattern which must be associated in some way with geometric patterns and configurations. Thus, when Whitehead refers to eternal objects as inhering in God's primordial nature, he is in truth referring to a system of abstract structures.[7]

Summary

In this section we have considered the generic and formative elements of an actual entity. The actual entity was found to be atomic in nature and comprised of prehensions, which are the means by which the actual entity 'grasps' or 'takes up' into itself ingredients for its own concrescence. Prehensions are of two kinds, positive and negative. The former are those taken up with their potential into the concrescence of a particular actual entity, as its subjective data, the latter are

1. PR 319, 2. (Wolfe Mays, 1959, p58) 3. PR 271, 3. (Wolfe Mays, 1959, p58)
4. (Wolfe Mays, 1959, p58)
5.PR p39, 6.SMW p36, 7. (Wolfe Mays, 1959, p59)

those feelings not taken up in the actual entity, their role being to assist in the selection or rejection of what is taken up of the datum by the concreting entity. The subjective form, which establishes how the prehension feels the datum, and the primordial nature of God, influence the 'subjective aim', which, with eternal objects, is involved in the concrescence of every actual entity. Satisfaction completes the general process of concrescence through which the actual entity passes into the realm of objective immortality. In this mode the actual entity is a superject, which is part of the doctrine of the creative advance of the world which is the becoming, the perishing and the objective immortality of the actual entity. These doctrines involve the 'ontological principle' which establish the actual entity as the essential thing. All explanations concerning the process of becoming ultimately find their explanation in an actual entity.

The formative elements which participate in the concrescence are i) pure potential in the form of eternal objects, ii) the primordial nature of God and iii) creativity. The eternal object is described in terms of its potentiality for ingression. There are different modes of ingression and these affect what is finally contributed to the 'definiteness' of an actual entity. The 'conformal' role of the eternal object is what determines how the feeling is felt. The primordial nature of God is the mediator between things actual and temporal, and timeless potentiality. It is described as the divine element in the world. It represents the metaphysical aspect of the creative advance and the acquisition of a primordial character by the creative advance. The third formative element, creativity, is part of the 'Category of the Ultimate' the other being the 'many and the one'. Creativity can be recognised on account of the 'accidental embodiments' with which it is associated. We are aware of the ultimate because of what is actual. Creativity is a process with no nature of its own but contains the stability of a higher order. Creativity is the principle of novelty and also the principle by which the universe of the many separate entities becomes one actual occasion. 'Transition' is the name used to describe the way in which one actual world supersedes another as a 'novel togetherness'. This is fundamental to concrescence and is the advance from disjunction to conjunction, and is the fundamental metaphysical principle. This is the creative advance of nature.

6 Concrescence, Transmutation, Nexus and Societies.

This section will in two parts. The first part will describe the nature of concrescence and its phases, which will introduce a new terminology, including 'contrast', 'reversion', aversion and adversion and their relationship with appetite. Consideration will be given to various challenges which have been made to concepts involved in the description including the nature of time as an internal phenomenon of the process. As each phase is considered the relevant Categoreal Section will be consulted, in order to reflect more clearly Whitehead's intention for its operation. The second part will be concerned with the VIth Category of Obligation, 'transmutation', and the development of 'nexus' and 'societies'.

An analysis of concrescence clearly indicates the nature of process: "The process of concrescence is divisible into an initial stage of many feelings, and a succession of subsequent phases of more complex feelings, up to satisfaction which is one complex unity of feeling. This is the genetic analysis of the satisfaction which is one complex unity of feeling."[1] Thus, through a succession of phases new prehensions come into being derived form the prehensions of antecedent phases[2] such that the process includes integration and re-integration from phase to phase.[3] The three main phases relate to firstly, 'Conformal', second, 'Conceptual' and third, 'Comparative' feelings.[4]

Whitehead indicates that the different phases do not represent different physical times. He describes the actual entity as experiencing 'a certain quantum of physical time' and that the process is not a temporal succession, each phase and feeling being within the framework of the whole quantum. This produces a 'subjective unity' which by its very nature, excludes the possibility of division on the basis of linear time. This description is compatible with his theory of the epochal nature of time.[5] The unity of the entire quantum is pre-supposed by each phase, as it is by each feeling in each phase. To conceive the quantum as anything other than a complete unity would destroy the subjective unity, which in fact is the originating force arising from of the primary phase of the subjective aim. According to Whitehead the doctrine is summed up by saying that: "physical time expresses some features of the growth, but **not** the growth of the features."[6]

1.PR p220, 2.PR p76, 3.PR p220, 4.PR p164, 5. Other reference to the of the epochal theory of time is made in Chapter 1, Section 2, Sides 50/51) 6.PR p283.

Thus an actual entity can be recognised as a process from the initial phase from the prehending of many other datum occasions by an actual entity from its causal past, through a subsequent series of operations with incomplete subjective unity, to completion in an integrated complex of feeling, united in that occasion's actual world. This completion is its satisfaction.[1] The termination of the actual entity is in a complex of positive and negative prehensions.[2] Each phase of the process is a synthesis of increasing degrees of complexity for each phase adds its own element of novelty. In such a unity of satisfaction all indetermination has been removed. All the entities of the universe have a role in the final unity of the satisfaction of the actual entity.[3]

According to Whitehead the analysis of the nature of an actual entity is to be regarded as an 'intellectual' description. It can only be understood in terms of 'process' and 'passage', for though it is divisible into phases it is still to be regarded as undivided.[4] Even so the process can be described as, a cell with atomic unity which suggests a physical entity under the same constraints as everything else which is temporal. Prehensions disconnected from the process are abstractions, they are units in themselves, of their own subject though in isolation. They achieve actuality in the totality of the prehension with a subjective unity in the process with component others.[5] The number of prehensions is indefinite though they overlap, subdivide, and supplement each other. They may be detected by selecting any component of the objective datum of the satisfaction of an actual entity. In the complex form of the subjective pattern of the satisfaction, will be a component with direct relevance to the selected element in the datum. Thus in the satisfaction there will be a prehension of the component of the objective datum which has as its own subjective form, the total subjective form of the new entity.

However, Donald Sherburne regards Whitehead's description of concrescence as 'intellectual', as a way of overcoming the difficulty of how a process with phases, which implies that one phase is antecedent to another, can be outside physical time. Whitehead's suggestion is that there is no absolute time in the Newtonian sense, in which objects exist, but rather that time is internal and is only abstracted from the process of succeeding actual entities. Sherburne refers to the conclusion of William A Christian on this issue, that such a priority of one phase over another could not be a temporal priority, nor simply a doctrinal priority, but only 'sui generis'.[6] Sherburne believes that

1.PR p219, 2.PR p44, 3.PR p211, 4.PR p277, 5.PR p235, 6. (Sherburne, 1966, p38).

this is the best answer offered to date, in order to overcome this difficult problem, but in so far as this is simply to accept Whitehead's description, it hardly appears adequate. He also encourages Whitehedian scholars to continue searching for a more convincing answer, for it is so central to the whole process that it simply cannot be abandoned.[1] The real test rests upon the general impression derived from Whitehead's description regarding the separation and sequence of prehensions.[2]

Finding a solution to this difficulty will not be an easy task. As Wolfe Mays points out, the materialistic approach to reality experiences difficulties in explaining the differences within its own doctrines of apparent and causal nature, and it has even more problems when it is confronted by the notion of biological organisms. These cannot be expressed in terms of a material distribution at an instant. Thus, a philosophy based upon a biological organism is clearly incapable of a solution from within the framework of the traditional theory of materialism. However, an organism does still require a duration or quantum of time, which is temporal extension. The materialist doctrine of self contained instants, independent of everything else which may be described as taking place 'in time' cannot be expected to solve this difficulty.[3] These considerations must be set against Whitehead's denial of any sense-awareness of an instantaneous present: "What we experience is what he terms a duration - a present whole of nature - which contains within itself a past and a future. A duration also implies its apprehension by a percipient event, which is, he says, roughly 'the bodily life of the incarnate mind.'"[4]

Ann Plamondon considers the question of the incoherence of materialism and a mechanistic approach to an explanation of material phenomena, in relation to the organological interpretation as an explanation of the actual world. Even so she does not appear to offer any solution to this question of a description of time in the process of concrescence.[5] Evander Bradley McGilvary however, suggests that in his description of concrescence, Whitehead has actually denied the

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1.(Donald Sherburne, 1966 p38)
2.(Donald Sherburne, 1966 p39) We will observe in Section Eight, pp , the way in which Whitehead used his own version of the Relativity Theory, to justify his description of the re-iteration of pattern.
3(As we observed in Chapter I)
4 Wolfe Mays, Whitehead's Philosophy of Science and Metaphysics, Martinus Nijhoff, The Hague, 1977, p49.
5.Ann Plamondon, Whitehead's Organic Philosophy of Science, State University of NewYork Press, Albany, 1979, p63/4.

evidence of experience. According to McGilvary experience suggests that objects do have parts. He cites the geological theory of the formation of sedimentary rocks and challenges the investigator to make their own test by crushing a stone. Why then does Whitehead assert in the face of the evidence that objects have no parts and that entities have parts. In other words Whitehead has rejected the case for which there is evidence of experience and substituted it by one for which there is no evidence.[1] McGilvary suggests that Whitehead's description of an event as a 'becoming' is in contradiction of his earlier statement that events have parts, for it raises the question as to how a becoming can have parts. Further, he expresses his concern at Whitehead ' 'Platonic' approach to his philosophy in the concrescence of the actual entity which demands the introduction of the eternal in the temporal, thus creating a 'cleavage' between the eternal object and the event. According to McGilvary, this is a bifurcation of nature. Although this does not solve the original problem bequeathed to us by Sherburne, we do learn two things from this contribution. It was essential for Whitehead to change his concept of the basic building block of nature from the notion of an 'event' to that of the 'entity', for by introducing atomicity into the philosophy he could retain the idea of process and at the same time retain the metaphysical concept of parts. Secondly, the challenge of McGilvary concerning 'events' and 'objects' demonstrates that the possibility of reconciliation between a materialist and a metaphysician are quite remote as there is no agreement between the two even as to the nature of an object.[2]

According to Whitehead, the primary phase of concrescence is the way in which the antecedent universe is taken up into the new actual entity thereby becoming the basis of the new individuality.[4] Although we may describe the simple physical feeling as one which feels another feeling, it is significant that the feeling which is felt has as its subject, characteristics different from the subject that feels it. The first phase of concrescence is constituted by a multiplicity of such physical feelings which collectively become the common feelings of the new actual entity.[5] All simple physical feelings commence this way, the more complex forms developing in subsequent phases by the integration of simple physical feeling with each other and with conceptual feeling.[6] The first phase is simply the reception of the actual world which is in process of being felt by the simple physical feelings.

1. (Schilpp, 1951,p227) 2. (Schilpp, 1951,p227)
3. PR p152, 4.PR 236, 5.PR p245.

This Whitehead describes as 'aesthetic synthesis'[1] of the actual world with its potential to be felt. This is an exemplification of the metaphysical principle that: "...every 'being' is a potential for a 'becoming'. The actual world is the 'objective content' of each new creation."[2]

A simple physical feeling as subject of the new actual entity, may be described as having a dual role in so far as it is both the re-iteration of the feeling of the cause and also the effect.[3]Thus, simple physical feelings represent within themselves the reproductive character of nature and at the same time the 'objective immortality' of the past,[4]where 'objective immortality means the unique contribution made by every concrescence to the newness of the actual world. As a result this internal time is the conformation of the immediate present with the immediate past.[5] In this conformal phase, the interface between past and present, the objective content is transformed into subjective feeling.[6] Whitehead has presented this descrption of the first phase of concrescence in terms of causality, but we should also note that according to Whitehead, these simple physical feelings are essentially a primitive form of 'perception' without consciousness.[7]

The process of concrescence is explained in relation to the nine categories of obligation.[8] The first three categories are derived from the general nature of things. The first, of 'Subjective Unity' expresses the general principle that there is one subject, the final end which conditions each component feeling.[9] The second category of obligation is that of 'Objective Identity',[10] which asserts that the status of the self-identity of any entity at any instant of the universe has one role without any duplication. This is what self-identity really means. Each entity remains itself, in its part in the self-consistent unity. This development becomes the basis for the grounds of incompatibility.[11] The third category is that of 'Objective Diversity', which states that: "...there can be no coalescence of diverse elements in the objective datum of an actual entity, so far as concerns the functions of those elements in the satisfaction."[12] This category is best understood in terms of a particular application of the second category. Hence, the process of integration which is at the centre of concrescence is the result of the drive explained in these first three categories of obligation.[13]

According to Donald Sherburne, these categories are regarded as operating throughout creation and not simply within the experience of conscious beings:

1.PR p212, 2.PR p65, 3.PR p237, 4.PR p245, 5.PR p238, 6.PR p164. 7. PR p236, 8.PR p221, 9.PR p223, 10.PR p26, 11.PR p225, 12.PR p26, 13.PR p228.

"They are conditions of conditions of all possible actual worlds, rather than conditions of all possible experience. That is because in Whitehead's system experience is not restricted to conscious experience, but in a primitive form permeates all reality as prehensive activity."[1]

Whitehead explains that the significance of these categories is recognised by considering the actual world in respect of the 'medium' which leads to the particular concrescence of any particular actual entity[2] i.e. how it happens or is enabled to happen. In this way the process of integration which is the basis of concrescence, can be recognised as the result of the influence of what Whitehead calls the 'creative urge' on the concrescent unity of the universe of the actual entities. It is this which is described in these first three categories.[3]

Within the process of concrescence the creative urge reveals itself in two different aspects, one accounts for the origins of simple causal feelings, which are prehensions of actual entities, while the other accounts for conceptual feelings which are feelings with the datum as an eternal objects. It is these contrasting aspects that Whitehead calls the physical and mental poles of an actuality. Every actual entity has these two poles, though the effective influence of each may differ by degree in different actual entities.[4] The second phase of the process of concrescence is the fusing of these physical and mental poles into a 'unity of experience' through a process of self-formation.[5] The origination of the mental pole with its conceptual feelings is a direct counterpart to the operations of the physical Pole, though the two poles cannot be separated in their origins. The mental pole commences by recognition of the physical pole.[6] Hence, the actual entity is essentially di-polar so that the physical world cannot be understood without reference to the mental pole, which in this di-polar system, is the other aspect of the unity.[7]

It is as a result of the origination of the conceptual feeling that valuation of the subjective form can be established i.e. value up or value down.[8] Eternal objects are introduced into the concrescence as the datum for a conceptual feeling, when the positive prehensions being positively felt, and others which are negatively prehended, are eliminated. Explanation of this is achieved through the addition a further categoreal condition, Category IV of Conceptual Valuation.[9] The urge of the subjective aim will produce a 'balanced complexity', if the intensity of feeling, which is the result of the ingression of an eternal object as one element of a realised contrast between eternal objects, is negated by other such contrasts which are not compatible.

1.(Donald Sherburne, 1966 p42). 2.PR 226, 3.PR 228, 4.PR p239, 5.PR p108, 6.PR p248, 7.PR p239, 8.PR p246/7, 9.PR p26.

Joint ingression is then not possible.[1] It is important to note that 'contrast' is not to be confused with the normal usage of the word in to distinguish features in a comparison of unlike qualities. Here it means 'to put in a unity with', which makes it the very opposite of incompatibility. Complexity means the realisation of contrasts, and of contrasts of contrasts, while balance means the absence of any weakening as a result of the elimination of contrasts. It would be expected that some elements in the pattern would introduce complexity and others would not.[2] What is required to retain diversity are consistent contrasts in complexity. Without these there will be only inadequate diversities which cannot lead to intensity.[3]

Donald Sherburne points to the somewhat misleading nature of the word 'contrast' used to describe the 'unity' of many components in a complex datum. Clearly it differs from normal usage as 'comparison of the unlike' or even 'opposites'. Different characteristics which are compatible with the subjective form and which still comply with the subjective aim, are being adapted into a unity.[4] Whitehead introduces this by combining 'Subjective Unity', Category I and 'Subjective Harmony', Category VII. Of the Category of Obligation. Thus, the origins of all feelings can be tested for suitability of inclusion into the final synthesis by the imposition of a subjective test: "Whatever is a datum for a feeling has a unity as felt. Thus the many components of a complex datum have a unity, this unity is a contrast of entities."[5] The establishment of contrasts is important in so far as objectification involves the elimination of incompatibilities. A 'contrast' expresses the unity achieved by the many elements of a complex datum . In Whitehead's terminology, to set in contrast is to be in a unity with, thus representing the very opposite of 'incompatibility'. Thus, the greater the degree to which an actual entity can achieve a contrast between the different items of experience, and establish contrasts of contrasts, the greater the degree of intensity of satisfaction is achieved. The inability to hold items of experience in contrasts, is the hallmark of primitive actual entities, where incompatibilities lead to the rejection of some experiences, with the result that the level of experience remains relatively shallow.[6]

Ivor Leclerc suggests that the whole phase of re-enaction can be better understood if consideration of the role of the eternal object is introduced, where its role is recognised as relational, in so far as it relates object to subject. Whitehead is stating that:

1.PR p278, 2.PR 278, 3.PR p255, 4. (Donald Sherburne 1966, p216) 5.PR p24,
6. (Donald Sherburne, 1966, p216)

> "...The definiteness of the feeling of the cause is determined by the ingression of a particular eternal object (to consider the simplest case). In other words, that feeling is defined as being what it is by that eternal object; the eternal object is the 'form' of the feeling. When the feeling is re-enacted, the same eternal object is determinant of the definiteness of the feeling as re-enacted."[1]

Leclerc reminds us that the eternal object is separate from the definiteness of the actuality which it is determining, only conceptually. This is as a result of the inability to separate it from the feeling, for the eternal object is the form of the feeling which belongs to the actuality.[2] We could express this by saying that the eternal object is that which determines the 'form' of the cause. This is the way in which the eternal object functions with a dual role, enabling the cause to be felt objectively in the effect. Hence, this answers the question as to how actual entities, each with their own formal existence, objectively enter into, and thus become part of other actual entities.[3]

The concrescence of experience is made possible as the result of the integration of phase I of the physical feeling with phase II of the conceptual feeling. the inclusion of a physical and mental pole in the di-polar aspect of a physical feeling, provides for both physical and mental experiences. A second source of conceptual feelings is derived from the eternal objects which form the data of the primary phase of the mental pole. Their identity and diversity is determined by the subjective aim and the depth and intensity of contrast achieved.[4] The first phase of the mental pole is conceptual reproduction according to Category IV of Conceptual Valuation, while the second phase is concerned with conceptual diversity from physical feeling according to the Fifth Category, that of Reversion.[5] Reversions are the conceptions which are generated as a result of 'lure of contrast'. This is a condition for the development of intensity of experience.[6] Reversion produces the contrasts which are essential for the aesthetic ideal, consequently there is a demand for the realisation of as many eternal objects as possible from within the constraints of conditions of contrast. The limitation of the conditions of contrast is the demand for balance, so that limiting the constraints upon contrasts means that no realised eternal objects shall eliminate potential contrasts between other eternal objects. Such elimination would weaken the intensity of feeling

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1.Ivor LeClerk, Whitehead's Metaphysics, An Introductory Exposition, George Allen & Unwin Ltd. 1958, p159.
2.Ivor LeClerk, Whitehead's Metaphysics, An Introductory Exposition, George Allen & Unwin Ltd. 1958, p159.
3.Ivor LeClerk, Whitehead's Metaphysics, An Introductory Exposition, George Allen & Unwin Ltd. 1958, p160.
4.PR p249, 5.PR p26, 6.PR p249.

which could be derived from the ingression of the different elements of the pattern. The introduction of the category of reversion leaves unanswered questions as to how, and in what sense an unrealised eternal object can be proximate to an eternal object having ingressed into a concrescence i.e. as compared with any other eternal object which is as yet unfelt. Such a question can only be answered in relation to the ontological principle and thus in relation to some actual entity, for it leaves the necessity of establishing the relationship between the primordial nature of God and the subjective aim.[1]

As observed, there has been a general recognition of the need to investigate the relationship between God and the subjective aim.[2] The category of Reversion at first played a significant role in the subjective aim. Ivor Leclerc describes concrescence as a 'growing together' in an epochal unit, concerned with the achievement of a particular novel unity as its outcome, recognises the legitimacy of Whitehead's insistence that there must be a conceptual prehension in the primary phase of the subjective process, the role of which is to direct the course to be taken by the concrescing activity from the outset. As such it must be a primary conceptual feeling. This raises the question as to the nature of the physical prehension from which it arises. It is the application of the category of relativity which states that it is necessary for any actuality that becomes to be an object for subsequent actualities. However, the way in which it becomes does not depend upon its antecedents but to a decision derived from the actual entities in the process of concrescence. The data from which it is choosing, is 'myriad' in magnitude. But according to the 'ontological principle' this conceptual prehension must be derived from an actual entity. The question for Whitehead was how these two principles could be reconciled.[3]

Whitehead was clear that he was facing the same metaphysical question as challenged Aristotle and Plato in similar circumstances in his philosophy[4] i.e. the question of the relatedness of 'being' and 'definiteness'. Furthermore, according to Leclerc, the solutions were essentially the same. This metaphysical question requires the acceptance of a unique entity which is pure 'being' and the cause of the forms of 'definiteness' revealed in the temporal world. This being can only be expressed in terms of the infinite being of 'God'. He summarises the argument thus far as agreeing that: "...no actual entity in the process of becoming can itself provide the regulative principle' indispensable to its process of concrescence."[5] According to Leclerc, Whitehead's

1.249/50. 2. (Ivor Leclerc, 1958, p190/91) 3.SMW p215/16, 4.(Ivor Leclerc, 1958, p192) 5.(Ivor Leclerc, 1958, p193)

conclusion is that there must be a unique actual entity which can provide other actual entities with the subjective aims which they require. This makes clear why Whitehead described God as 'the principle of concrescence'. However it is also important to state that: "God is not to be treated as an exception to all metaphysical principles, invoked to save their collapse", for to treat God in some way as an exception to the metaphysical principles laid down in the philosophy, would be to negate them. This is a crucial consideration in the question of the coherence of Whitehead's whole philosophical scheme.[1] It was in fact in order to retain this coherence after the role of God, that Whitehead abandoned the category of Reversion.[2]

It is the subjective form of the conceptual feeling which has value as its characteristic, and if that value 'upward' it is 'adversion', or if the valuation is 'downward' then it is 'aversion'.[3] These two are thus types of decision. Where adversion is present the reproduction of the physical feeling as one element in the resulting objectification is secure. This is important because such progression can be stifled by the inclusion of incompatible objectifications derived from other feelings. So when adversion is produced by the resulting valuation of a physical feeling it is also producing a force for persistence beyond itself into the future.[4] On the other hand when there is aversion in the physical purpose this 'transcendent' force of creativity takes on the role of inhibitor in limiting the effect of that particular objectification in combination with that particular feeling. There is little likelyhood of that subject continuing in the future: "Thus adversions promote stability; and aversions promote change without any indications of the sort of change. In itself an aversion promotes the elimination of content, and the lapse into triviality."[5] The inclusion of one of these two characteristics into the conceptual physical feeling and its valuation means the inclusion of purpose, for it becomes the agent by which the causal efficacy of its subject is fixed relating to objectification beyond itself.

Dorothy Emmet focuses attention on the 'Decision making' nature of the whole process of concrescence. It is this that Whitehead has described as a 'self-formation' which implies that there are alternative possibilities and a decision is made between them.[6] The word 'decision' is the notion of a 'cutting off' in the progress of the actual entity towards its satisfaction. Some possibilities are accepted and others are rejected.[7] Thus an actual entity, which Whitehead described as 'stubborn fact', is also a decision. We may set this against the pure possibility of the

1. (Ivor Leclerc, 1958, p193) 2.PR p250, 3.PR p254, 4.PR p277,
5.PR p254, 6. (Dorothy Emmet, 1966, P114) 7.(Dorothy Emmet, 1966, P41)

eternal object which is not bound or determined by decision. Unbounded potentiality alone can produce nothing, so that actuality must always be regarded as a limitation and the result of a decision between alternatives.[1] It is by excluding other forms of definiteness that the actual entity envisages the possibilities in its decision.[2]

Prof. Emmet notes how close Whitehead is to Leibniz and Samuel Alexander on this point. She believes that Whitehead would agree with Leibniz that although self-consistent thought may divulge the possibilities available, it is only a decision that can form an actuality out of those possibilities. Further, with reference to the 9th category of obligation, that: "...the concrescence of each individual actual entity is internally determined and externally free," he is reflecting the definition of freedom by Prof. Alexander as 'determination as enjoyed'.[3] The reason why an actual entity is externally free is because its nature is not determined simply by an analysis of its prehensions. What it becomes depends upon its decisions which are stimulated by the emotions, appreciation and purpose it passes to its prehensions. These qualities and values will be influenced by its subjective aim which thereby involves the actual entity in final causation.[4]

Whitehead finds support for this interpretation of the notion of decision from the course of history.[5] Because no obvious clear cut reason can be given as to why events took one particular course as opposed to any other, which results in the acceptance of the direction taken as having been internally determined, so also we may be justified in applying a similar logic to the history of thought. This could lead us to attempt some tracing of the development and history of ideas.[6] According to Prof. Emmet this may offer some justification for concluding that: "...there is a certain internal dialectic to the history of thought."[7]

The term 'appetition' is used to describe this 'matter of fact' which includes the 'principle' of unrest, resulting from the operation of the fourth categoreal obligation. As a consequence of reversion this result in novel conceptual feelings produced in the mental pole of an actual entity, so that by appetition, that actual entity may condition creativity in such a way as to provide for a future physical realisation of its mental pole. Thus: "Appetition is at once the conceptual valuation of an immediate physical feeling combined with the urge towards realisation of the

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1.(Dorothy Emmet, 1966, P192) 2.(Dorothy Emmet, 1966, P114)
3. (Dorothy Emmet, 1966, P198) 4. (Dorothy Emmet, 1966, P114)
5.PR p46, 6.PR p47, 7. (Dorothy Emmet, 1966, P199)

datum conceptually prehended."[1] But the term appetition is also used in conjunction with the primordial nature of God which is 'unfettered conceptual valuation' from the realm of eternal objects.[2] This so called : "...ultimate basic adjustment of the togetherness of eternal objects on which creative order depends" is more than simply conceptual feeling, it is conceptual valuation.[3] The primordial nature of God is constituted by the graduated order of appetition.[4] It is this which is prehended by every actual entity in its own concrescence. It is through appetition that God is able to pursue and implement purpose.

In the third phase of concrescence we can recognise two types of 'Comparative Feeling', physical purposes and propositional feelings. All feelings owe their existence to a process of integration between the primary simple physical feelings of phase I and its conceptual counterpart of phase II.[5] This integration of the first two phases is what produces phase III which is a physical feeling. The subjective form of this feeling has either gained or lost in subjective interest through the formation process, and this is measured in terms of an increase or decrease in valuation i.e. an up or a down in conceptual feeling. It is this change in subjective form which Whitehead refers to as 'the phase of physical purpose'.[6]

The datum of the integrated comparative feeling is a contrast between the conceptual datum of phase II and the nature of the 'objectified nexus'. Whitehead describes the resulting physical feeling as 'feeling a real fact', and the conceptual feeling as 'valuing an abstract possibility'.[7] The new datum is the result of the degree of compatibility of the fact of the comparative feeling as felt with the appropriate eternal object which is a datum of feeling associated with this.[8]

Whitehead states that it is as a result of physical purposes that a more detailed explanation of feeling can take place within the philosophy, as it fulfils its role of forming the basis of a cosmology. There is than a natural progression to the doctrine that all actual entities include physical purposes. It is the inclusion of such physical purposes which explain why there is a permanence to the order of nature, which is what the order of nature reveals. It is as a result of the addition of value of the physical feeling that the characteristics of adversion and aversion are contributed to the process of 'transcendent' creativity.[9]

1.PR p32, 2.PR p247, 3.PR p32, 4.PR p207. 5. PR p239. 6. PR p248, 7.PR p276, 8. PR p 248/9, 9.PR p276.

Whitehead reminds us that a conceptual feeling is not of this actual world, which is what governs our conception of existence. The history of our world plays no more part in the existence of a proposition than it does in that of an eternal object, for both are concerned with the general nature of things within the realm of undetermined actual entities. The datum for a conceptual feeling is an eternal object. It is only in this sense that a proposition shares in the indeterminateness of an eternal object that it has something in common with it. The proposition itself gives nothing away concerning its origins.[1] Whitehead makes the analogy between the colour red and degrees of redness found in our actual world, which is what interests the empiricists. The colour red is not an actual entity but redness is discovered through our experiences of this actual world: "A proposition enters into experience as the entity forming the datum of a complex feeling derived from the integration of a physical feeling with a conceptual feeling.[2]

A 'proposition' is defined as:

> "The unity of certain actual entities in their potentiality of forming a nexus, with its potential relatedness partially defined by certain eternal objects which have the unity of one complex eternal object. The actual entities involved are termed 'the logical subjects', the complex eternal object is the predicate."[3]

However, there are major differences between a proposition and an eternal object. Propositions are not eternal objects, actual entities nor feeling, but a completely new kind of entity. An eternal object is by definition entirely abstract, not only in relation to actual entities but also to the concept of the role of the primordial nature.[4] An eternal object has avoided selection by any actual entity - in any epoch - whereas a proposition is based upon actual entities as referent. Propositions are about truth and falsity based on reason and thereby could not be an eternal object. Reason is based upon a world of actual entities, following the ontological principle. A proposition is complex in nature, including actual entities as some of its components. It is these same actual entity components that enable the establishment of the truth or falsehood of the proposition. These two aspects of a proposition may be summarised as it retaining the indeterminate nature of an eternal object while at the same time making a partial abstraction from determinate actual entities.[5]

The role of the proposition regarding 'lure' of an actual entity is an important one for when an actual entity is part of the locus of a proposition it becomes part of the lure of that actual entity,

1.PR p257, 2.PR p256, 3.Category of Explanation XVII. PR p24, 4.PR p256, 5.PR p256/7.

so that as the process of concrescence continues and the proposition is admitted into feeling, the proposition becomes what has been felt by the feeling. The same proposition is lure for any member of its locus because of the kindred nature the complex predicate has to the logical subjects. In this it must take account of the 'forms of definitions' in the actual world of that member, as well as to its preceding phases of feeling.[1]

What a proposition has in common with an eternal object is indeterminateness, for both are potentialities for actuality without the power to determine what becomes actuality. But whereas an eternal object refers to a general actuality, a proposition refers to particular logical subjects. The expression of truth and falsehood require some kind of given environment for them to have real meaning, which is supplied by the logical subjects of a proposition. In a similar way an eternal object requires some element of a given fact in order for it to be able to demonstrate what it is.[2] Sherburne's criticism of Whitehead here is that he failed to make clear the relationship between 'Physical Purposes' and 'Propositional Feelings'. In fact he suggests that both are forms of 'Simple Comparative feeling' For example a term Whitehead uses in this context is 'impure prehension' but this is clearly another term for a 'propositional feeling'. Yet understanding the relationship between the two is important in the understanding of 'complex comparative feelings', the final phase of concrescence: "In an intellectual feeling the datum is the generic contrast between a nexus of actual entities and a proposition with its logical subjects members of the nexus."[3] The contrast is between the affirmation of objectified fact in the physical feeling and the mere potentiality in the propositional feeling, which represents the negation of the affirmation. It is a contrast between realised fact and the possibility of fact. Whitehead refers to this as the 'affirmative- negation' contrast.[4]

Prof. Emmet describes the sensitivity with which Whitehead deals with the question of stability and adaptability which emanates from the notion of contrast. It is from this third phase of concrescence that intensity of satisfaction may be sufficient to culminate in life or consciousness. She describes the progressive order required as always reducible to a balance between contrasts and its breakdown into chaos i.e. there is no permanent stability.[5] Yet there must be some 'creative order' for without it there could be no 'creative advance into novelty'. She refers to the aesthetic harmonisation of these apparent cross-purposes. It is possible that Whitehead's thinking

1.PR p186, 2.PR p258\9, 3.PR p266, 4.PR p267. 5. (Dorothy Emmet, 1966, P217)

is based more upon aesthetics than physics or even ethics. Ultimately according to Whitehead, all order is aesthetic order.[1]

According to Bertram Morris, although Whitehead has refused to develop his aesthetic theory,[2] he can detect a clear parallel between the historic process of development through which the aesthetic fact comes into being i.e. between the aesthetic or genetic analysis, and Whitehead's genetic process of concrescence in the philosophy of organism, in which an actual fact is a fact of aesthetic experience.[3] Morris likens the process of art, or the aesthetic situation, with its three phases of the historical process of the 'receptive', the 'supplemental' and the 'consummatory', to the three phases of Whitehead's 'concrescence', the aim of each being that of 'satisfaction' or objective immortality. Both satisfaction and objective immortality are included in the aesthetic situation. Having established that it is important for aesthetic purposes, to distinguish the process from the end, Morris continues the analogy by pointing to the most far reaching problem in aesthetics as being how to understand individuality. His conclusion is that the aesthetic situation itself is one of the most obvious examples of experiential realisations of individuality, with its own inherent justification and value, with the meaning of perception as disclosure of individuality as the meaning of ultimate concrete fact.[4] The first phase of the art process may be described as 'receptivity', which is the relationship of an organic body to: "...the so-called physical world."[5] In the first phase of conformal feeling, Morris believes we can say that Whitehead is dealing with creativity, a topic which demand serious consideration of past, present and future and the nature of process, which must also include 'receptivity'.[6] In his analysis of phase two of concrescence, that of conceptual feeling, Morris finds adequate provision for the inclusion of high grade experience which involves: "...the real togetherness of the physical matrix with subjective processes issuing into the objective unity of an actual entity."[7] He also recognises a great importance of the introduction of value into the process ion the inclusion of the nine categories of Obligation. Whitehead's continuous insistence upon the priority of process being possibly the greatest contribution to aesthetic analysis. Process involves teleology and Whitehead's refusal to abandon final causation simply as a result of its contemporary unpopularity is also commended.[8]

Such conclusions are the result of taking potentiality seriously. When we do, it is then that we

1.RM p105, 2. (Schilpp, 1951, p477) 3.PR p280, 4.(Schilpp, 1951, p465)
5.(Schilpp, 1951, p466) 6. (Schilpp, 1951, p467/8) 7. (Schilpp, 1951, p468)
8.(Schilpp, 1951, p470)

discover that we are facing experience 'realistically'. Morris pursues his analogy of phase II of concrescence with the functioning of art still further. Process implies continuity but includes both change and permanence. Whitehead's doctrine of the actual entity as the concrescence of prehensions as part of that process of becoming, is an attempt to make potentiality intelligible.[1] Potentiality in art becomes beauty only through a process of determination. The language of Whitehead's philosophy is applicable in art, to describe the conceptual feeling as an 'appetite' which drives towards new possibilities. The inclusion of eternal objects can function in relation to the experience of appreciation. Decision in both systems means inclusions and exclusions.[2] Art is possible only as a result of the finite decisions involved. It thrives only if there is genuine novelty and not simply repetition. The principles at the base of art are those of identity and contrast. Identity is possible only if there is diversity and unity, which are at the heart of the meaning of the philosophy of organism.[3] Decision can also lead to frustration which must eventually find consonance otherwise discord will destroy the aesthetic.[4]

Morris found self expression at the heart of Whitehead's philosophy, revealed in a process of imagination founded upon the data of our world. He believes that it is only in a philosophy which takes process seriously that some understanding of experience can be achieved. Whitehead's philosophy of organism demands great respect and by staying close to the text of Whitehead's various writings, it has been possible to construct Whitehead's theory of aesthetics.[5]

Evander Bradley McGilvary does not find a problem with Whitehead's description of concrescence itself, but rather as to the location of the process. He points out that prehensions do

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1. (Schilpp, 1951, p470) 2.SMW 247, 3.(Schilpp, 1951, p473) 4. (Schilpp, 1951, p474)
5. (Bertram Morris, The Art-Process and the Aesthetic fact in Whitehead's Philosophy, Schilpp, 1951, p477)
Morris did find difficulty in relating Whitehead's 'division', in which prehensions and prehensions of prehensions appear to produce an atomism, for this is at odds with aesthetic experience. The Provisional realism, as effected by prehensions, prompts the question as to whether this can really be helpful to the genetic analysis, which Whitehead has on his own admission, described as containing an element of arbitrariness. PR 235 However, we have already observed one suggestion as to why it became necessary for Whitehead to introduce the notion of 'entity' to replace 'event' (See Side 128) thus leaving the requirement intact, of finding a solution for the incompatibility of the atomicity of the entity with an analysis of aesthetic experience. Further, Morris describes Whitehead's inclusion of eternal objects as an intrinsic part of the aesthetic process, as a difficulty: "Eternal objects are the most troublesome of Whitehead's categories." (Bertram Morris, The Art-Process and the Aesthetic fact in Whitehead's Philosophy, In: Schilpp, 1951, p480)

appear to have a location in space and time, as do all prehensive occasions and that Whitehead has expended considerable energy to refuting the notion of simple location. As a result it remains open as to whether Whitehead has justified two apparently contradictory positions.[1] According to McGilvary Whitehead's defence is implausible. He believes that Whitehead has adopted the Leibnizian concept of the 'Mirroring' when he states that "... every volume mirrors every other volume in space."[2] But Whitehead's monadic creature, the actual entity, is involved in a process of feeling the world in the process of concrescence. Such a process does not involve 'dislodging' another creature. That is unnecessary because 'everything is everywhere'. He recognises a further complication in so far as not everything is taken up in the occasion of concrescence, as a result of negative prehensions, but only what the prehension deems as effectively useful in its own concrescence. Whitehead's defence of the rejection of 'simple location' rests upon the notion of prehensions, which are themselves linked with doctrine on 'perspectives'. Now we should expect a systematic philosopher to link the elements of the philosophy into a coherent unit as Whitehead has done, but according to McGilvary, linking the doctrine of 'simple location' to that of 'perspectives' only leads to his doctrine of 'objectification' which takes us a full circle to the initial descriptions of concrescence.[3]

Whitehead deals with this by introducing his 'Categories of Explanation' which include the statement that the concrescence of each new entity includes within itself other actual entities. These are to be in part or whole within its own constitution. Thus a novel entity is where and when the concrescence occurs. According to Whitehead it is in this sense that 'everything is everywhere at all times' but McGilvary rejects the suggestion that this is a kind of 'mirroring' in spite of Whitehead's doctrine that an actual entity objectifies what it prehends.[4] In this case 'objectification' means a particular mode in which the potentiality of an actual occasion is realised in another.[5] Thus the general scheme, of an actual entity prehended from its own perspective standpoint does make sense. Whitehead calls this a 'geometrical perspective relatedness'.[6]

The virtue of Whitehead's scheme according to McGilvary, is that he has recognised that aspects of things are everywhere and at an indefinite number of times. For example a thing can have two owners and it need be located with neither of them. In his doctrine of 'simple location' Whitehead has avoided this predicament. The description of a concrescent occasion enables the

1.PR p225, 2.PR p277, 3.(Schilpp, 1951, p230) 4.(Schilpp, 1951, p232)
5. (Schilpp, 1951, p233) 6.(Schilpp, 1951, p234)

new entity to become yet leave the old where it was before. But it is this which McGilvary finds implausible in spite of the description itself being a complete unity for he totally rejects Whitehead's claim that there is nothing in experience which exemplifies the characteristic of simple location. Is Whitehead justified in reducing all such apparently contravening examples - of sense objects - to the mode of presentational immediacy'? He accuses Whitehead of simply having categorised perception in such a way as to support his doctrine on simple location. To suggest the doctrine is a fallacy, which implies self-contradiction, is thereby to accuse other who do not agree as being 'fallacious rivals'. Is this not beyond the spirit of Whitehead's own statement that his position is one of 'tentative formulation of the ultimate generalities.[1]

The discussion of the important aspects relating to the morphological description. This is the extensive analysis of the actual entity as a completed unity.[2] The process of its becoming has been completed or 'satisfied' such that it is available for the concrescence of other actual entities. By participating in the concrescence of other actual entities in a process which transcends itself, it is described as an object. It has reached a stage described as objective immortality.[3]

Transmutation and the Macro, the Order of Social Societies

In this second part we will commence with a description and assessment of the doctrine of Transmutation, its different phases and its role in the creation of the actual world, followed by discussion on the philosophical and metaphysical questions raised by the doctrine relating to its description of the union of the metaphysical with the actual. Its importance will be judged in relation to its function of completing the way in which the information in a single conceptual prehension of the metaphysical realm, can be prehended by the temporal world of actuality. This will be followed by consideration of the relationship of the actual entity to the functioning of social society.

The word 'transmutation' is that used to describe the process by which entities form groups to become nexus and societies which can be prehended as a unit rather than by their own individual characteristics and feelings. The unit becomes the datum of a prehension which transmutes the entire nexus as one. This is the step from the microcosmic, intellectual world, to the macrocosmic world we know of human experience of things and people.[4]

1. (Schilpp, 1951, p237) 2.PR p219, 3.PR p220 4.PR p250.

Transmutation may be analysed in terms of its phases as was concrescence. The first phase involves the analogous feelings with diverse subjects which are scattered throughout members of a nexus. They constitute a multiplicity being prehended by a single subject, in which he nexus becomes the data for a corresponding multiplicity of its own simple physical feelings. Some of these feelings may be pure and some hybrid.[1] The single subject then formulates a process by which, analogous various feelings within that subject, which are constituted by one eternal object related to the various analogous data, is converted into one feeling having as its datum the contrast between the nexus and the eternal object. The second phase is as an intermediate stage which is the formation in the final subject of a simple conceptual feeling, with that same eternal object as its datum. This conceptual feeling is impartial which enables it to the formation one nexus derived from the integration of the many members of the original nexus with diverse physical feelings. The new nexus is then set in contrast to that one eternal object which has emerged from the various analogous feelings.[2]

> "Thus, pure and hybrid, physical feelings, issuing into a single conceptual feeling, constitute the preliminary phase of this transmutation in the prehending subject. The integration of these feelings in that subject leads to the transmuted physical feeling of a nexus as qualified by that eternal object which is the datum of the single conceptual feeling. In this way the world is physically felt as a unity, and is felt as divisible into parts which are unities, namely, nexus."[3]

The complete datum of a 'transmuted feeling' is by definition, the single conceptual feeling of the nexus of the hybrid physical feelings, with the associated eternal object as datum of the single conceptual feeling.[4] It is this integration which makes possible the transmutation of the physical feeling of the nexus, qualified by the same eternal object, which is the datum of the single conceptual feeling of the many macroscopic entities of the original hybrid physical feelings, being prehended as one. This particular type of contrast is an exemplification of the notion of the 'qualification of physical substance by quality'.[5] It is in this way that the world is physically felt as a unity, yet although felt as a unity, it is divisible into parts which are themselves unities, namely, nexus.[6]

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1. "The mental poles of actualities contribute various grades of complex feeling to the actualities including them as factors. The basic operations of mentality are 'conceptual prehensions.' These are the only operations of pure mentality. All other mental operations are 'impure' in the sense that they involve integrations of conceptual prehensions with the physical prehensions of the physical pole" PR p33
When a physical feeling is the feeling of another actuality which is objectified (is an object in the actual world) the physical feeling is termed 'hybrid. PR p225
2.PR p250, 3.PR p250, 4.PR p251, 5.PR p27, 6.PR p250.

As in the case of concrescence, we should note that the phases though not separate, do represent important steps conceptually. The process of integration of simple physical feelings into one complex feeling, for example, only provides an explanation as to how the various individual actual entities of the nexus are felt as one individual nexus. The third phase accounts for the way in which the single ensuing nexus acts as a 'substitute' for the component actual entities. To achieve this the third phase draws upon the philosophy of organism as an atomic theory of actuality. This overcomes the difficulties experienced in other monadic cosmologies, such as that of Leibniz for example, in the attempt to describe the relationship between the metaphysical realm and the actual world, a step required in all such cosmologies. Whitehead regards previous attempts to formulate such an explanation as inadequate. In the case of the philosophy of organism it is the category of transmutation which provides a physical feeling of a nexus as one entity, in order to accomplish this transference.[1]

Thus the many physical feelings of diverse actualities originate one conceptual feeling in the final subject. This provides it with an impartial reference in relation to the actualities of the nexus. Hybrid physical feelings in the prehending subject react in a similar way under the guidance of category IV, their role being to enhance the intensity of the conceptual feeling. It is through this impartiality of the conceptual feeling that the integration of the many different and separate actual entities can become one nexus and which helps to set this nexus in contrast against the eternal object which 'has emerged' from the analogous characteristics.[2]

The same impartiality in the conceptual feeling must be transmuted into the physical feeling of the nexus, so that the one impartial conceptual feeling becomes an essential element in the whole process by being carried through into the nexus.[3] The eternal object which characterises the physical feelings in the nexus may be the eternal object which characterises the analogous physical feelings which belong to all or some of the members of the nexus. In such a case the nexus as a whole will experience a character which to some extent is expressed in all its members.[4] Modifications in the process can be used to account for perception in the mode of presentational immediacy and therefore by implication, causal efficacy, and the introduction of novelty beginning as new forms of conceptual experience which are then transmuted into physical experience.

1.PR p251. Whitehead's explanation of the inadequacy of the Leibnizian attempt to deal with this question through a doctrine of 'confused perception' in his monadology, is discussed in section 9.
2. PR p252, 3.PR p250 4.PR p253.

Whitehead uses the example of colour to illustrates the transmuted feeling becoming a definite physical fact, which, as the final subject, prehends the nexus regardless of its own particular history of transmutation. In an 'unfortunate case' novelty could be classified as an error. Colour blindness would still be regarded as a physical fact even though it is an error. A transmuted feeling is defined as a physical feeling.[1] In a simple physical feeling the initial datum is a single actual entity, in a transmuted physical feeling the objective datum is a nexus of actual entities. Simple physical feelings and transmuted feelings together make up the class of physical feelings.[2] Thus, the usual way we prehend the world is by these transmuted physical feelings which are analogous in their integration to the actual world to perceptual feelings, conscious perceptions and judgements. Vagueness can also be accounted for by transmuted feelings, for a characteristic of quality of mutual prehensions of the members of a nexus, may be transmuted into the predicate of a nexus.[3] This would imply loss of intensity. It is the force of the repetition of particular intensities which makes certain perceptions prominent, in that type of feeling. This applies where further integrations would lead to consciousness of an element of their subjective forms.[4]

Donald Sherburne illustrates the operation of transmutation by considering the colour 'red' as characterising the datum occasion, as in phase II. The single conceptual feeling which arises has the eternal object red as its datum. In the third phase there is a contrast between the simple comparative feeling of the second phase and all the other physical feelings which are involved in phase one. The transmuting feeling arises to prehend the nexus of datum occasions in its entirety, qualified by the same eternal object red as a physical feeling, so that the many microscopic entities have become one macroscopic entity.[5]

Prof. Emmet refers to Whitehead's awareness of the difficulties experienced by metaphysical philosophers who attempt to demonstrate how 'groups' can have a common characteristic, a goal Whitehead is attempting to achieve through the operation of his Vth Category of Obligation, Transmutation. According to Emmet, the complication of the process of transmission is in ensuring that: "...all that is felt is an attenuated character of the original nexus, which is then applied as a generalised predicate to the nexus as a whole."[6] What surprised Emmet was being told that in perceiving a stone we are in fact feeling the feelings of the stone, but this is the result

1.PR p253. 2.PR p27, 3.PR p253, 4.PR p253, 5.(Sherburne 1966, p74)
6.(Dorothy Emmet, 1966, p159)

of Whitehead's description of the transmission of feeling. Thus 'objectification is one actual entity becoming the basis of another, described in terms of 'conformity' and the 'reproduction' of the feelings of one in the other.[1] "According to Whitehead's theory of transmission 'Objectification' means the reproduction in one actual entity of the feelings of the other."[2]

Wolf Mays distinguishes two applications of the category of transmutation, one in its operation as the way in which the microscopic events of the physical world become the macroscopic objects of the actual world we experience i.e. through the transmuted feeling, and another in the physiological and psychological process of perception.[3] Mays is not convinced by Whitehead's description of the way transmutation explains why we perceive, not simply forms of energy involved in events, but rather tables chairs and trees and the like. This is central to the way in which the philosophy of organism explains our world. Mays questions whether the category of transmutation, used as the basis for an explanation by the philosophy of organism, is truly an improvement on the answers offered by the physics of the scientific revolution of the 17th century. For example, Whitehead considers it to be an advance, to conceive of unities and nexus functioning in the extensions of time and space and described in terms of physics, as sufficiently concrete to be convincing. But according to Mays, Whitehead's scheme would need to be expressed in terms of algebraic equations, which would include a quantity and time element, and these would be as distant from our experience of the actual world as the concept of 'matter at an instant', which Whitehead is attempting to replace.[4]

The relationship between the one and the many is a related doctrine at the heart of 'Creativity' on which 'Transmutation' depends. An actual entity alone is nothing. The goal of concrescence is 'satisfaction' and this is only achieved in relationship to the available universe. Whitehead describes the nature of the coming together of the one into the many as a Nexus. One of the important characteristics of a 'nexus' is that it exemplifies the principle of 'the many' and 'the one' in real unity. It is the recognition that the self fulfilment or satisfaction of an actual entity is achieved through being one among many, while also being one of the many.[5] Thus, the togetherness of actual entities is as real being in a unity, as it is true for being any one

1.(Dorothy Emmet, 1966, p159)
2.(Dorothy Emmet, 1966, p160) (Similar concerns as these regarding transmutation will be discussed in Chapter Three, Sections 11 and 12)
3.(Wolf Mays, 1959, p165) 4. Wolf Mays, 1959, p232 or 221) 5.PR p145.

single actual entity. It is from this idea of 'togetherness' that Whitehead derives the term 'Nexus':

> "A nexus is a set of actual entities in the unity of the relatedness constituted by their prehensions of each other, or - what is the same thing conversely expressed- constituted by their objectifications in each other."[1]

A nexus is described as possessing 'social order' when three conditions are fulfilled, the first is that there is an aspect of form in the element of definiteness which is common to each of the actual entities, the second is that this common element of form has its origin in each actual entity as a result of its prehension of another member of the nexus, and thirdly, that the conditions of reproduction imposed by the prehensions, are as a result of the entities own inclusion of the positive feelings of that common form: "Such a nexus is called a society."[2] Thus the term 'Society' is no more than a nexus with social order. The common form of the society becomes its defining characteristic, where the element of form is an eternal object which is manifest in all members of the nexus.[3]

The essence of a society in this context is that it is self-sustaining, or, it is its own reason and is thereby is more than simply a numerical collection of entities to which the same title can be applied. The class name must apply as a result of the genetic nature of the entities within it having derived their nature from each other. The characteristic in common which unites them is an imposed characteristic derived from their being together and sharing that likeness.[4] There cannot be a society in isolation for to understand 'society' is to relate it to a background environment. This background is itself made up of other societies with their own characteristics to which each member conforms. Each society experiences a 'permission' from the background for it to exist as a self sustaining entity , but more positive is the contribution of the elements on which the society is founded and by which it is able to be called a society.[5]

The natural conclusion to this description is that any particular society will in fact be a part of a formation which constitutes a larger society and which is the background for the existence of other similar societies to itself, for it had drawn upon that background in order to become a society itself. Whitehead proposes a principle which states that every society requires a social background and each society is part of that background.[6] From the viewpoint of any one society, there are layers of societies and these are formed into a social order, ever widening on an increasing scale as the background widens. This is the entire world of actual entities. According to

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1.PR p24, 2.PR p34, 3.PR p34, 4.PR p89, 5.PR p90, 6.PR p90.

the philosophy of organism, causal laws within a society are the result of the defining characteristics of society, whereas the efficiency of a society depends entirely upon the individual members of that society. So the life of individual members of a society depend upon the laws which dominate that particular society, though the reason for their dominance is because of the character of the members which gave rise to the society in the first place.[1]

Such a system of structured societies is one way of providing the necessary environment for subordinate societies, for the single society is helping to provide a wider environment which is conducive to its own continuance. Some subordinate groups are truly societies but others are described as subordinate nexus. The differentiation between these two is important. There will be occasions when a particular enduring entity would have had the ability to retain its own dominant feature in the wider society, if it had not been a member of the structured society in which it is found. It may have given features away, such as its own dominant feature, in order to be part of that structured society. There would then be a case for recognising its potential independence from the structured society. An example of this is a molecule in a living cell because: "...its general molecular structure is independent of the environment of the cell. In such a case the title of this structure in the structured society is 'subordinate society".[2]

Conversely, there may also be other structures which do not demonstrate any particular feature which would be genetically sustained, outside the realm of the structured society in which it is found. Whitehead refers to such cases as 'subordinate nexus'. Applying this to the example of the living cell, the occasions constituting the empty space within the cell are displaying special features which are not detected in analogous occasions outside the cell. Hence the nexus of the living space within the cell is described as a 'subordinate nexus'.[3] Whitehead relates the notion of a 'defining characteristic' between the members of the nexus or society to that of Aristotle's notion of 'substantial form'. According to Whitehead, this common element of form in the philosophy of organism is simply the exemplification in each member of an eternal object.[4] But the social order may in fact be more than this common form, and establishing the relationship between the subjective form of the actual entity in concrescence, which becomes the essence of its being, and this reference to form as it applies to the defining characteristic of a nexus, and thereby also a society, is not a link that can be made without some justification.

1.PR p91, 2PR p99, 3.PR p99, 4.PR p34.

Wolfe Mays recognises this distinction, in so far as types of entities other than actual entities and eternal objects only express in their communities in the actual world, the unity of actual entities and eternal objects. All other entities of all different types are recognised as derivative sub-varieties of the two fundamental types i.e. the enduring objects of our actual world. Mays describes this as the basis of Whitehead's philosophy of nature in which entities and sense objects are regarded as the basis of our sense experience of nature.1

Ivor Leclerc describes Whitehead's description of the relationship between the actual entity and the actual world as being up against a crucial ontological problem. It is to pose the question as to what really is it, that 'is'. In Process and Reality Whitehead has associated this truly 'real' entity with his unitary epochal entity, the actual entity. According to Leclerc, this places Whitehead, like Leibniz, in the tradition of the material atomists of the 17th Century, who associated the fundamental nature of what truly 'is' with the ultimate constituent essence of those composite things. This endows all composites such as objects, with a derivative ontological status. It is upon the basis of this tradition that although an object as an entity based upon a continuous process of atomic events could not be considered as an 'actual entity', it did constitute a society of actual entities, so that Whitehead could attribute to a 'society' the status of the fundamental reality of that which 'is', though the object as entity is of a different ontological order.[2]

According to Leclerc, we should be cautious about accepting such a tradition without some thought, for as Aristotle noted, it is not necessary to award the primary ontological status of that which 'is', only to the ultimate entities which constitute the composite bodies or entities. Following that route, simple bodies could justifiably be regarded as having the status of 'substance' in its fundamental materialistic interpretation. Just as Aristotle could argue that merely because all simple bodies are regarded as what 'is', does not mean that all that 'is' must be simple bodies, so also in Whitehead's scheme, it would not be legitimate to hold that because all unitary epochal events are regarded as having the status of actual entities of that which 'is', it validates the approach that all actual entities must be unitary events. The justification for the

1.Wolfe Mays, Whitehead's Philosophy of Science and Metaphysics, Martinus Nijhoff, The Hague, 1977, p90 See Category XIX of Explanation.
2.Ivor Leclerc, Process and Order in Nature, In: Whitehead and the Idea of Process, Proceedings of the First International Whitehead Symposium, Ed: Harold Holz and Ernest Wolf-Gazo,1981, p132.

adoption in Whitehead's scheme, of the doctrine that unites the fundamental actual entity with the primary epochal unitary event, is that each is absolutely ontologically dependent upon the other, such that this provides the necessary continuity: "This I would maintain, enables a successive plurality of such epochal events to have an ontological unity as 'a being', i.e. as one 'actuality', which is a unity of a plurality of constituent primary epochal events."[1] According to Leclerc it is the adoption of this structured relationship between these two basic unitary entities that has influenced Whitehead's description of societies as developed in Process and Reality.[2]

Ann Plamondon approaches the same philosophical question by asking whether the complex orders of nature Whitehead designates as 'societies' are sufficiently dealt with by the categories of 'organism' and 'environment'. Discussion is necessary as a result of Whitehead's distinction between societies and primary organism. Plamondon emphasises both the non-materialistic nature of the primary organism in what is essentially a non-materialistic philosophy, as described by Whitehead, as well as the doctrine that the notion of organism includes: "... the concept of the interaction of organisms."[3] She notes Whitehead's change of the fundamental unit, or 'primary organism' from 'event' to 'entity' or 'actual occasion' and that a set of actual entities is referred to as a nexus. The criteria by which social order makes a nexus a society, are carefully defined[4] But in our current discussion, it is what Plamondon regards as the 'principle issue' that is of most significance i.e.: "...whether or not both primary organisms and societies can be conceived as falling under the category of organism ..... as characterised in terms of modification by the whole (primary organism of society)." Ivor Leclerc offered a reason to justify Whitehead's doctrine linking the fundamental unities of the actual entity and the epochal unity of a time event in one essential atomic organological scheme. Plamondon suggests a search in the text to establish whether Whitehead intended societies to be regarded as of the same categorical order as organisms because she detects evidence in the text both for and against this proposition.[5]

1.Ivor Leclerc, Process and Order in Nature, In: Whitehead and the Idea of Process, Proceedings of the First International Whitehead Symposium, Ed: Harold Holz and Ernest Wolf-Gazo,1981, p133.

2.This discussion is necessary as a result of Whitehead's change in the description of the basic building block from 'event' in SMW, to 'entity' as an atomic unit in PR. This was in order to accommodate the construction of a more plausible description of process. See Section page 3. SMW p151,

4.Ann Plamondon, Whitehead's Organic Philosophy of Science, State University of New York Press, Albany, 1979, p52.

5.Ann Plamondon, Whitehead's Organic Philosophy of Science, State University of New York Press, Albany, 1979, p53.

Whitehead drew attention to the principle of differentiation, which makes a particular society a special society. First, it must include features which are not found in other societies in different occasions.[1] The second step concerns 'more subtle' observations as to the different behaviours in and outside the society, necessitated because of the different occasions which have close similarities to each other. Although, according to Whitehead, the history of science reveals a determination not of recognise the existence of such examples, he finds an example in the proposal of change of shape of an electron resulting from changes in its environment.[2] Hence, his description is that: "A 'structured society' may be more or less 'complex' in respect to the multiplicity of its associated sub-societies and sub-nexus and to the intricacy of the structural pattern."[3]

Whitehead also differentiates between the notions of 'social order' and 'personal order'. What has been described under the heading of 'society' is a nexus with social order. An 'enduring objects' or 'creature' is an example of 'social order' as 'personal order'. An ordinary physical object with temporal endurance is a simple society having 'personal order'. A nexus has personal order, when it is a society and when the genetic relatedness of its members manifests itself serially. This results in a single line of inheritance as one of its definite characteristics. In this case the nexus referred to as an 'enduring object'.[4] Whitehead avoided its description as 'personal' because that word suggests consciousness, which would be misleading. Though the nexus has developed a degree of 'character', which is an element in the meaning of the word 'person', an enduring object is involved in more than simply achieving this, for its 'sustenance' of character has been derived been derived from its special genetic relationship of the members of the nexus.[5] Thus, according to the philosophy of organism, an ordinary physical object with temporal endurance is a simple society and in its most basic form as an enduring objects will have personal order. Not all societies can be analysed into different strands of enduring objects but those which can represent the ordinary physical objects which are the permanent entities we observe in our world of time and space as they experience its changing events i.e. these objects are the societies analysable into strands of enduring objects which have their unique histories in the time and space of the temporal universe we perceive. They are what are studied in science and dynamics. To summarise, though actual entities die but do not change, - they are what they are - a nexus with enduring social order, termed a 'corpuscular society' will

1.PR p99, 2.PR p100, 3.PR p100, 4.PR p35, 5.PR p35.

have degrees of corpuscularity depending upon the relative importance of the defining characteristics of the various enduring objects. The degree will be in relation to the defining characteristic throughout the entire corpuscular nexus.[1] This relationship may be understood in terms of a balance between the two sets of characteristics, where an increase in one is balanced by a proportionate decrease in the other.

A highly complex structured society can favour development to satisfaction for particular members of its constituent members. As a result of the ordered complexity of contrasts, the intensity of individual experiences has an effect on the structural relations: "Thus the growth of a complex structured society exemplifies the general purpose pervading nature."[2] This means that the complexity of the 'givenness' from which the society began, as the source of the incompatibilities, has been supplanted by the complexity of order. It is this order from which spring the necessary contrasts.[3]

According to Ivor Leclerc we should recognise the 'order' involved in Whitehead's descriptions of nexus and society, which reveals a pattern of aspects in the data in question. This pattern suggests that the data is dominated by particular characteristics in so far as it partakes of elements of definiteness in common. As well as disclosing sets of characteristics in the groups or nexus which are dominant, by implication, there are characteristics which may be incompatible. Thus we should recognise feelings of order and disorder in a nexus and that the common determinate factors of a nexus or society are social. Leclerc describes Whitehead's 'society' as a vehicle for value in which the role of the society is for the enhancement of value through intensification. It is for this reason that Whitehead describes it as more than simply conveying the notion of a class or type.[4] Leclerc also highlights the importance of the role of societies in Whitehead's philosophy, for it is through this doctrine, in conjunction with that of the actual entity, that Whitehead solves the difficulty experienced in traditional, antecedent European philosophy, which has conceived substances as enduring.[5] Substances have been ascribed self-identity and individuality and regarded as requiring nothing else for their existence. The resulting relations between substances become largely accidental, but in spite of that, substances are constantly in interrelationship with one another and changes in relationship affect the subject. According to Leclerc, it is through Whitehead's doctrines of societies and actual entities that this traditional problem is solved, for in

1.PR p35, 2.PR p100, 3.PR p100, 4. Ivor Leclerc, Whitehead's Metaphysics p215,
5. Ivor Leclerc, Whitehead's metaphysics, p216. (Leclerc refers to AI p261/2)

this philosophy of organism it is societies which endure. The theory of the concrescence of actual entities accounts for change and those of societies as epochal units for stability or 'changelessness'. There is a reconciliation between the two through relatedness which metaphysically is as fundamental as self-identity and individuality. Discussion as to what is essential and accidental is removed from the substance (entity) and placed in the context of society. Thus we can find some justification for Whitehead's association of his 'society' with Cartesian 'substance'.[1]

Robert Spaemann recognises the importance of the relationship between the role of societies as described in the philosophy of organism and the survival of stones and organic organisms. As observed earlier, such enduring objects are built from societies and not directly from actual entities. But Spaemann goes further in pointing out that the concrete is not only living organisms but so is everything else, which includes the inorganic. The environment is shaped by and for both organic and inorganic organisms. Thus, in Whitehead's philosophy the final real thing is an organising activity which, through its action, fuses the different ingredients into the unity of the reality at the base of things. The only way that it is possible to conceive the notion of concrete reality is by attributing to it something like the notion of 'Selbstsein' (being-in-itself) and 'Fur sich sein' (being for itself). Being for itself includes the teleology of 'condition', 'disposition' and 'concern'. Spaemann reminds us that the being of 'Dasein' was described by Heidegger in these terms but Heidegger denied the possibility that 'being' or 'concrescence' could in any way be attributed to the non-human.[2]

According to Spaemann, Heidegger's doctrine that the existence of things is simply an abstraction from their being at a distance from their concreteness, is reflected in the position taken by Thure von Uexkull in his philosophy of the living. He describes what is 'not alive' as 'pre-actuality', insisting that things only become concrete in an organological environment. Questions of time and causality only have meaning in the context of living organisms and it is only a living organism that can formulate a structure of the process of the world into its different elements. Such a doctrine raises questions as to why we encounter, as a ready made structure, the environment we

1. Ivor Leclerc, Whitehead's Metaphysics p217
2.Robert Spaemann, Which Experiences teach us to Understand the World?, Observations on the Paradigm of Whitehead's Cosmology, In: Whitehead's Metaphysics of Creativity, State University of New York, 1990, p160.

do encounter, which appears to resist the dichotomy between 'being' and 'being at hand' and why the world is in no way simply an environment for the living organism, for it reveals a force sufficiently powerful to destroy its environment.[1] On the evidence of Whitehead's existential ontology and philosophy of life, Spaemann believes that Whitehead has demonstrated his view that the concrete is only what fulfils the roles, not only 'being' for other things, but also 'being' for everything else. Thus, each thing shapes the environment for itself, ensuring that the environment is the product of all. He finds this summed up in Whitehead's saying: "The final real entity is an organising activity, fusing ingredients into a unity, so that this unity is the reality.[2]

Wolfhart Pannenberg refers to Whitehead's 'societies' as his more complex forms of natural evolution, noting that they are described simply as diversely ordered series of actual occasions. They appear as stable unities even though ultimately they are demonstrated as not being such. In spite of being the stable and purduring form, and thereby have a vital ontological importance, there is less space devoted to them in PR than to the actual entity. To explain this by suggesting that the reason is because they are higher forms, derived from the description of actual occasions, is, according to Pannenberg, to introduce a style of thinking which characterises materialism, being the very thing Whitehead had sought to replace. Pannenberg concludes: "The fact that the emergence of form cannot be derived from the actual occasions of which they might consist shows once again that the unity of the field cannot be reduced to elementary momentary events which appear in it."[3] He believes that this reveals the 'one-sided' nature of atomism as a description of nature, for this individual discreteness hardly appear to do justice to the metaphysical forms such as eternal objects introduced into his scheme by Whitehead.

The possible solution to the impasse envisaged by Pannenberg is of great significance for Sherburne's suggestion that more research is required by Whiteheadian students into the nature of

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1.Robert Spaemann, Which Experiences teach us to Understand the World?, Observations on the Paradigm of Whitehead's Cosmology, In: Whitehead's Metaphysics of Creativity, State University of New York, 1990, p160.
2.Robert Spaemann, Which Experiences teach us to Understand the World?, Observations on the Paradigm of Whitehead's Cosmology, In: Whitehead's Metaphysics of Creativity, State University of New York, 1990, p16 ?, SMW 193.
('Zuhandensein' is translated as 'being at hand' which means 'being at a distance from their concreteness').
3.Wolfhart Pannenberg, Atom, Duration, Form: Difficulties with Process Philosophy, In: Whitehead's Metaphysics of Creativity, State University of New York, 1990, p174.

time in concrescence. The result of Whitehead not conceiving the phases of concrescence as 'temporally successive', which first appeared to many as paradoxical, now reveals itself as essentially temporal by Whitehead's own analysis of process, the final aim of the form of which is already present. Further, as Pannenberg points out, recognition of the fact that the final aim of concrescence is already present in the process seems to be at the base of all life process, be it in plant or animal. The specific nature is only revealed in consequence of its genesis: "By way of anticipation it is in each instant already that which it only becomes in the process of its growth." What it becomes does not emanate from a momentary event but from its nature or its essential form. It is this form which 'perdures' through any accidental course of time. Thus, there is a link between the essential nature of the form and its growth.[1]

Such an interpretation re-instates the significance of society in the totality of Whitehead's scheme The growth of complexity through structured societies is thus the process of the becoming of the thing. These comments by Spaemann and Pannenberg lead us into the next two section which will consider aspects of the Whiteheadian system in the actual world. The first of the two will be concerned with the highest forms of society in, 'life', and the 'living', and the second with 'process' and 'perception'.

Summary

We commenced by considering concrescence and its phases. The implications of Whitehead's exclusion of the duration of the process from physical time was examined and found to raise many questions including those of materialism and the instantaneous present. From the doctrine is produced the metaphysical principle of becoming. It reveals the presence of the creative urge, manifest through the subjective form of the actual entity. The introduction of a specific role for God in relation to the subjective form, and ultimately to the subjective aim, to replace the Category of Reversion was noted. The description of the process of concrescence as 'self - formation through decision was considered focused on the unrest of the activity which is matter of fact. This introduced the notion of appetition which is a combination of the conceptual valuation of the immediate physical with the urge towards realisation. The third phase of concrescence was found to concern the integration and intensification of feeling, which is the phase of physical purposes. The role of propositions, which were entirely abstract and concerned truth and falsity

1.Wolfhart Pannenberg, Atom, Duration, Form: Difficulties with Process Philosophy, In: Whitehead's Metaphysics of Creativity, State University of New York, 1990, p174.

based on reason, was in their association with 'lure' through the actual entity which was part of the locus of proposition. This linked propositions to aesthetics.

The 'transmutation' is ascribed to the process by which entities form groups and become nexus and societies and their 'transmutation' into the realm of the macro from that of the micro. This process may also be analysed into phases as was that of concrescence. The transference of what becomes the objectified objects of our actual world through feeling, and that we feel the feeling of the objects was recognised as a notion requiring further explanation. Feeling is being made to account for both the conceptual and the physical aspects of the actual world. This revealed the link between 'transmutation' and 'Creativity' and 'perception'. This is accounted for by the differentiation of nexus and societies, and 'social' societies and those with 'personal order'. Societies with personal order are differentiated from those of 'simple societies' which are responsible for the temporal endurance of physical objects, thereby distinguishing between the organic and inorganic. Thus a person may be described in terms of societies with social order as personal order in a highly structured society of complex order. This is based on the doctrine of societies in which societies continue to form larger societies within the framework of a background of even larger societies as structures and subordinate societies. Societies are what form the enduring objects of the actual world. Because societies form these structures and not actual entities directly, this raised the question as to what is it that 'is'.

7. Living Societies and consciousness

This section will be in two parts. The first part will establish the definition of 'living societies', the primary meaning of life and the measurement of life by degree. This will be followed by the theory of the animal body according to the philosophy of organism, considered in conjunction with the consequential rejection of the traditional theories of life which are currently dominant. The second part will be explore the theory of consciousness according to the philosophy of organism.

Living societies and the theory of the animal body.

The possibility of the development of living societies, according to the philosophy of organism, is dependent upon the achievement of three sets of conditions. The first is the establishment of stability in a particular society in relation to the wider environment. The nature of the wider environment must be conducive to the needs of a society's own continuance if what Whitehead describes as 'Living Societies' are to be established. Stability of a society is established if it can endure changes in the wider society by absorbing them and incorporating them as parts of itself. If a society is unable to continue adapting to persistent changes in its environment, in spite of its own hetrogenious nature, its own stability will be put in jeopardy, and it will eventually become unstable. When a complex society has withstood changes of this nature in its environment, Whitehead refers to it as 'specialised' in respect of these features. However, an unspecialised society can survive significant changes in its environment by adapting its functions in relation to the changes. In such a society the general characteristic will not include any one single thing which dominates its structural pattern, but rather it will have a degree of flexibility in adapting to the needs of the moment. It is exactly this characteristic of being deficient in structural pattern that will help it to survive.[1]

The difficulty for an unspecialised society is that, though it can survive, it will not produce generally favourable conditions for the intensity of satisfaction. This may be compared with a structured society of great complexity which does produce these favourable conditions for intensity of satisfaction but does not survive well. Hence, the difficulty for nature is to be able to produce societies which are structured with high complexity and which can also survive i.e. to combine intensity with survival.[2]

1.PR p100, 2.PR p101.

According to Whitehead, nature can be seen to solve this problem in two ways, both of which concern the mental pole of the actual entity and the enhancement of its retention of intensity of experience. In the first instance, survival is achieved by establishing a massive 'average' of the total nexus in such a way that detail and specialisation are eliminated.[1] The second way in which the problem can be solved is through appetition, which Whitehead refers to as: "...an initiative in conceptual prehensions".[2] The second of these ways of survival provides the second condition towards a living society. The purpose of the initiative is to enable the mental pole to convert novel elements from the environment into explicit feelings so that their subjective form can reconcile them to the complexities of the experiences of the members proper of the structured society. This would result in the subjective aim of each concrescent occasion originating novelty in such a way as to match the novelty of the environment. In lower organisms this initiative simply represents thoughtless adjustment of an aesthetic bias in response to the ideal of harmony in the whole. Even so, the creative forces which would determine the nature of the society have been 'deflected' by the originality of the new initiatives. The deflection triggers a reaction towards self-preservation through the whole society. If that response is inadequate then it signals the demise of that society.[3]

The third stage of development is achieved through the same initiatives, referred to above, which, when applied to the higher organisms may be described as 'thinking' about the diversity of experiences. In this case there has been a reaction against those external forces which would, if unchecked, lead to the destruction of the society. Structured societies which respond to the problem in the second way are called by Whitehead 'living societies'. They may have 'life' by degree, some being more 'alive' than others, but there is no absolute gap between living and non-living societies. Life as we know it may or may not be important in a society, depending upon the

1. This procedure is based upon what Whitehead regarded as a fundamental truth, that 'objectification is abstraction'. The development of detail which could lead to specialisation is stifled. It utilises that fact by changing the potential objectifications into negative prehensions, while at the same time supporting the whole complex intensity of the structured society by the 'massive objectifications' of the different nexus in the environment, each one as a unity of **one** nexus, rather than as a multiplicity of **many** individual actual occasions. PR p101 Material bodies represent the lowest form of structured society of which we are aware in our widest experience of nature. They may themselves be of varying degrees of complexity, for example crystals, rocks, planets and suns. These represent bodies of the longest duration and whose life histories can be most easily traced.
2. PR p102, 3.PR p102

nature and duration of the determining elements of that particular society. Whitehead calls a structured society in which life is unimportant 'inorganic': "In accordance with this doctrine of 'life', the primary meaning of 'life' is the origination of conceptual novelty - novelty of appetition."[1] A society can only be termed 'living' in a derivative sense, for a 'living society' can only be one which includes some 'living occasions'. This means that a society will be more or less 'living' in relation to the preponderance of the living occasions. Furthermore, an individual occasion may be more or less living as measured by the relative importance of the novel factors in its final satisfaction.[2]

It is important to note two other factor regarding the degree of life in a society. The first concerns the patterned, interweaving nature of the nexus, which have their own diverse, distinctive characteristics. Some nexus may be described as having 'lower' and others 'higher' types of defining characteristics, as well as there being some dominant nexus and other subservient nexus in a society.[3] The main structured society is the environment for all these types of sub-societies. The distinguishing feature of the 'living' society is that it includes living 'nexus' as the dominant nexus, for in what may have been simply termed a 'living' society not all the nexus will have the mental poles of all the actual entities involved in novel reactions. There will be some nexus which will be inorganic. As a result they may not require any protection from a changing environment. These are subordinate nexus but they do still affect the nature of the society as 'living', or an 'entirely living', society.[4]

The second factor is the protection a living society receives from its immediate environment. Protection for an entirely living nexus is provided by the establishment of a 'complex inorganic system' set up for that purpose through the reactions of the whole system. The origination of the living elements must be accompanied by the provision of this protection through the necessary environment. Hence, it is the reactions of the system as a whole which provide protection to the

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1.PR p102, 2.PR p102,

3. Whitehead describes both types of feeling of valuation of a conceptual feeling, 'upward' which is 'adversion' with increased intensity influencing the new subjective form, and valuation downwards which is 'aversion' leading to either the elimination of the physical feeling or its transmission with decreased intensity, (PR 254) as the result of a massive simplification, characteristic of the higher grades of actual entities. Although these high-grade intensities appear to have little influence on the constitution of the actual entity itself, they play a dominant role in the physical feeling of enduring organisms, both organic and inorganic. (PR 314)

4.PR p103.

entirely living nexus. Whitehead argues that all known living societies do have such a matrix of subservient inorganic societies. It is the combination of both the subservient inorganic structure with the many living nexus which give the living society its resilience.[1]

Whitehead refers to this subservient inorganic structure in terms of 'Physical Physiology', which has developed its own identity in the last century as a unified science. The term 'Psychological Physiology' is applied, in the philosophy of organism to the description of the 'entirely living nexus'. According to Whitehead, these principles appear to fit the facts of the actual world and are also coherent within the philosophy of organism itself.[2] Psychological Physiology also offers, from within the philosophy, some direction in the important debate of the so-called 'Mind - Body' problem.[3] In Considering a single living cell, which includes subservient inorganic societies such as molecules and electrons which represent an animal body, we are investigating its living occasions, which presuppose its physical physiology.

Justification for this description requires consideration of other relevant detail. According to Whitehead, there is no evidence for regarding a cell as having a single unified mentality which is led from occasion to occasion by some inheritance from past experiences. The question is whether the living occasions, abstracted from the inorganic occasions of the animal body, form a corpuscular sub-society, such that each living occasion is part of an enduring entity with its own personal order, and further, whether this corpuscular society can be reduced to one single component of the society, i.e. to one enduring entity with its own personal order. Whitehead rejects both possibilities, but at the same time recognises that the evidence available for making the judgement is very small. This assumption in turn focuses attention upon the question of the source of originality. A solution could be discovered through evidence of originality of response to some external stimulation. But the theory of an enduring entity does exactly the opposite, it offers evidence of an inherited mentality being influenced by its own past. According to Whitehead, we should be searching for a more original explanation, instead of being satisfied with inadequate answers which limit originality, as described in an irrelevant doctrine of an enduring 'soul' with its permanence of characteristics. The traditional explanation of 'soul' makes soul no different in character from a stone. Nothing has been offered to explain the originality we experience in the higher life forms. 'Life' is a bid for freedom but what we are offered is an

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1.PR p103, 2.PR p103, 3. (See Chapter 1 Section 2 for the presentation of this problem)

answer which limits originality, because of its stress on inherited mentality. As we observed: "...an enduring entity binds any one of its occasions to the line of its ancestry."[1]

Friedrich Rapp expresses understanding of Whitehead's appeal to the need for an explanation of the originality of the things we experience as higher life forms. Consideration must be given to the relationship between the common experience of everyday things and the highly technical explanations of the complexities of the data provided by scientific investigation to facilitate the formulation of a comprehensive philosophy utilising scientific information. Whitehead has the same justification for his hypothesis as Descartes, Leibniz and Kant had for theirs, choosing to use scientific data as a reference point, while at the same time passing beyond the immediate brute facts. The question as to how well the task is performed can be posed regarding all such attempts.[2]

According to Rapp, this combination of scientific data and metaphysical speculation is particularly appropriate regarding this question of the organic and inorganic worlds, for some form of simplified scheme is essential. For example, in this case Whitehead is attempting to explain the complications of chemical reactions, the complete sequence of events involved in the development of an organism (ontogenesis) and its evolution as a species or genus (phylogenesis), cosmic evolution, intellectual and artistic creation, as well as an explanation for the unpredictability of events revealed in human history. An explanation for all these things is attempted in the formation of one single categoreal system, based upon his philosophy of process and the actual entity. Rapp's empathy stems from his recognition that, as he states: "...inevitably, his conceptual system leaves a broad space for interpretation and requires detailed exegesis."[3]

According to Whitehead, the same objections made against confusing the nature of an enduring object with 'life' or 'soul' apply even if we construct a theory based on a 'corpuscular society' where there are many different enduring entities. To add 'endurance' to an occasion is to burden it with all the limitations of a single line of physical ancestry. This applies as much to cases of many sources of influence as it does to one. But 'life' means novelty. We should recognise that

1.PR p104,
2. Freidrich Rapp, Whitehead's Concept of Creativity and Modern Science, In: Whitehead's Metaphysics of Creativity, State University of New York Press, Albany, 1990, p89.
3. Freidrich Rapp, Whitehead's Concept of Creativity and Modern Science, In: Whitehead's Metaphysics of Creativity, State University of New York Press, Albany, 1990, p89.

an organism is alive when there are measurable reactions which are inexplicable by any tradition of pure physical inheritance, where 'tradition' is a substitution for 'efficient cause'. According to Whitehead, what is truly required is an answer under the heading of 'final cause'. In the language of the philosophy of organism: "...a single occasion is alive when the subjective aim which determines its process of concrescence has introduced a novelty of definiteness not to be found in the inherited data of its primary phase."[1]

The introduction of such a novelty with its own value is the introduction of a conceptual feeling which interferes with what would have been the inherited 'responsive course of events' of the subjective forms, if the process had remained simply as a passing on of data. Thus, the conclusion derived from the philosophy of organism is that, abstracted from its animal body, an 'entirely living nexus' does not truly constitute a living society. The prevalence of 'life' means that life cannot be the defining characteristic of any one example of a living thing. Similarly, response to stimuli is a characteristic of all types of society, organic and inorganic alike. Whitehead links life to the present and not the past, but we would need to look to the past if life were simply part of the tradition of inheritance, as has been assumed. Just as action brings reaction, so also life is a specific reaction in its attempt to participate in the intensity of the immediate present, whatever the circumstances.[2]

In order to put these doctrines of the philosophy of organism into context we should recorded the attempts of modern science to offer a description of the origins of life. The first to be taken seriously was that of S W Fox in 1912, who suggested that life was originated by intense heat, thus effecting a change in amino acids so that they formed polymers which were water solvent. In 1936 the Russian chemist Operin suggested that life evolved by chance through random events in chemical processes in the oceans. A biochemical 'soup' was able to form which was conducive to life, a theory which is still the most widely held view today.[3]

The astronomer Fred Hoyle suggested that life appeared on earth about 3,500 million years ago in the form of simple bacteria and that over the next 500 million years, types of Algae appeared.[4] He

1.PR p104, 2.PR p104/5.
3. The TimeTables of Science, Simon and Schuster, 1988, Alexander Hellemans and Bryan Bunch, p427.
4. Fred Hoyle, Ten Faces of the Universe, Heinemann, London 1977, p143.

is convinced that the ingredients for life exist throughout the gas clouds within our own galaxy and in other galaxies. He suggests that the comments of Operin are now fairly well understood as to the first steps in the origin of life, in which simple inorganic molecules became more complex ones of up to thirty atoms and of organic molecules of amino acids,[1] the energy for this essential first step was supplied by the sun. His belief is that most commentators regard this as 'a highly probable event.'[2]

It is into the climate of such inadequate theories that Whitehead's theory should be examined . He makes clear how the term 'philosophy of organism' should be understood, if we are to appreciate its special contribution to the understanding of data. It comes from the result of applying the biological concept of 'organism', as an understanding and description of the form life itself takes, to the structure and form human life adopts in its social structure. Recognition that the social structure of human society is a product of nature, and humans are made of the same atomic structure as the remainder of the universe, leads with some justification to the application of the term organism to describe the nature of the whole of creation.[3]

Recognition of the nature of 'life' in the context described above, prevents us from searching for signs of life in any particular society of occasions, on the basis that 'life' is its defining characteristic. In this respect, an entirely living nexus is not social. The complex social environment supplies every member of the nexus with all the prehensions it requires. This is necessary because of itself the nexus lacks the genetic power of societies. However, an entirely living nexus, though not social, can still support a thread of personal order along a particular historical route: "Such an enduring entity is a living person."[4] Thus, although a person is an enduring object and such an entity may have 'life', it does not follow that the essence of 'life' is synonymous with being a living person. By these means Whitehead has separated life from the person.

There is no evidence of the development of personality in the lower forms of animal and plant life. In higher animals there is a more developed central drive and direction, and this is the evidence for the inclusion of a living person or persons within the animal. Whitehead points to human self-

1. Fred Hoyle, Ten Faces of the Universe, Heinemann, London 1977, p155.
2. Fred Hoyle, Ten Faces of the Universe, Heinemann, London 1977, p157.
3.PR p104, 4.PR p107.

awareness and self-consciousness as evidence for this. But this unified self control has its limits. Evidence suggests that it is possible for the living person to experience loss of personality or multiple personality, either jointly or successively. This latter condition is often associated with what Whitehead describes as the 'pathology of religion' and in earlier times may seem as demon possession and the like. Hence, though life through its essence gains in intensity through freedom, it can also submit to 'channelling' and gain greatly from the ensuing order.[1]

We do not have to insist that channelling is confined to cases of personal order, for it is justified to speculate that in the lowest form of life the entirely living nexus could be channelled into a weak form of conformity. Survival power, which is the result of adaptation and re-generation, is explained by such conformity to social order, but evidence for channelling is sparse: "Thus life is a passage from physical order to pure mental originality, and from pure mental originality to canalised mental originality."[2] We should also note that pure mental originality functions by channelling what is relevant from that which emanates from the primordial nature of God. Thus, originality in the temporal world, though not determined by the primordial nature, is conditioned by it through an initial subjective aim, which is derived from the basis of all order and all originality'.[3]

Henri Bergson believed that it is not possible to confine the living within the confines of the inert. In fact, the attempt to strip life of all the aspects about it which we ourselves experience leads us to a suspicion about science as a whole, as a result of inflicting this constraint upon us. The dogmatism which attempts to unify all science and thereby endow all sciences with the same authority for all pronouncements, presents philosophy with a serious problem. Philosophy is forced to swing between its quest for an understanding of absolute reality and that which will supposedly lead us to a better understanding of that reality. This self-inflicted impotence brings no gain to science itself. Yet science has left it to metaphysics to rediscover the unity which was at first assumed by all: "...a unity that we admitted blindly and unconsciously by the very act of abandoning the whole of experience to science and the whole of reality to the pure understanding."[4]

1.PR p107, 2.PR p107/8, 3.PR p108.
4.Henri Bergson, Creative Evolution, (Translation by Arthur Mitchell, Ph.D.) Macmillan and Co., 1911, p208

Thus, according to Bergson, the demarcation line between the inert and the living requires an investigation of a special nature, other than that conducted by what Bergson describes as 'positive science'. Science continues to attribute equal status to all the data it gains from its own experiences, including that related to the living and the inert, thus imparting a kind of equal relativity. It may continue to do this as long as it is recognised that the more it claims to penetrate the depths of the nature of life the more symbolic and relative to the contingencies of the science its conclusions become. Philosophy can follow science on this basis and superimpose on it knowledge gained from the recognition that understanding life does not require the strictures of organised matter. It does require that knowledge which is called 'metaphysical'.[1]

Here, Bergson is attributing the dichotomy between philosophy and science, referred to by Whitehead in 'Science and the Modern World', at least in part to the difficulties experienced by physical science in accounting for differences in the organic and inorganic. His observation that the 'something more' required for an understanding of this subject is metaphysics, accords well with the philosophy of Whitehead and at the same time raises the question as to the influence of Bergson on Whitehead's philosophy as a whole. The implication is that though the 'positive science' described by Bergson may continue its effort along the same lines not bear the desired fruit.[2]

To summarise the main points concerning living societies, we recognised the importance of the distinction made between 'personal order' and 'living occasions' in order to demonstrate that

1. Henri Bergson, Creative Evolution, (Translation by Arthur Mitchell, Ph.D.) Macmillan and Co., 1911, p209/10

2. There is no consensus among Scholars concerning the use of Bergson's philosophy by Whitehead. According to Victor Lowe, Whitehead neither consulted Bergson regarding his physical science (Schilpp, p66) nor was he directly influenced by his metaphysics, though he admired his lively originality. (Schilpp, p89) Whitehead's advance from physics to metaphysics is of an entirely different kind to that of Bergson. (Schilpp, p90) However, According to Filmer S C Northrop, there is only one major point in Bergson's philosophy with which Whitehead disagreed and that was Bergson's contention that 'spatialisation in science is falsification'. Otherwise he accepted Bergson completely in his doctrine of the primacy of 'Duration' and 'Process': "This factor can hardly be exaggerated. It presented the basic concept and doctrine of Whitehead's entire scientific and philosophical outlook." (Schilpp, p168/9) Further, William W Urban concludes that Whitehead's doctrine of 'pure experience' is most readily attributed to Bergson and James. (Schilpp, p307) Thus, we have a discrepancy of opinion as to the degree of use of Bergson's Philosophy by Whitehead, and its influence.

'life' is separate from the enduring object. The source of mental originality was recognised as being derived from the primordial nature of God, and therefore at the heart of the development of the mental process.[1] Explanation of the second way in which initiatives within transmutation arise in order to allow the society with an increased intensity of feeling, are described by Prof. Emmet as endowing the living body with adaptability and persistence.[2] She suggests that Whitehead has demonstrated that to achieve progression in the order requires a balance which is always on the verge of chaos. The balance is one between the immediate security and the originative element which can lead to life: "It is the razor edge between the dismissal of contrasts in favour of stable, if trivial, uniformity, and their admission at the cast of the disintegration of the organism."[3]

Bergson's description of life revealing itself as though: "...a broad current of consciousness had penetrated matter, loaded as all consciousness is, with an enormous multiplicity of interwoven potentialities" is not helpful to Whitehead in establishing a differentiation between consciousness and life. Bergson does, however, recognise degrees of consciousness and, apparently, degrees of life, as does Whitehead, even though in the case of Bergson the developmental path of the two is much closer and less easily separated than in that of Whitehead.[4]

Consciousness

In this second part we will consider Whitehead's description of the origin of consciousness, its distinction from the origins of life, and some of the implications of the description given of elements of experience in the actual world, such as aesthetics, judgements and imaginative thought.

The origin of consciousness, according to the philosophy of organism, is via an intellectual feeling: "In an intellectual feeling the datum is the generic contrast between a nexus of actual entities and a proposition with its logical subjects members of the nexus."[5] The contrast is between the affirmation of objectified fact in the physical feeling and the mere potentiality of the propositional feeling which represents the negation of the affirmation, i.e. there is a contrast between realised fact and the possibility of fact. Whitehead refers to this as the 'affirmation-negation' contrast.[6]

1.PR p107, 2. (Emmet, 1966, p216) 3.(Emmet, 1966, p217/8)
4. Henri Bergson, Creative Evolution, (Translation by Arthur Mitchell, Ph.D.) Macmillan and Co., 1911, p191. 5. PR p267, 6.PR p267.

Consciousness may be described as the feeling of the contrast between 'mere theory' and 'mere fact'. This contrast applies whether the theory is, or is not, correct, making consciousness more than simply 'the entertainment of a theory'[1]: "The principle that I am adopting is that consciousness presupposes experience, and not experience consciousness. It is a special element in the subjective forms of some feelings."[2] Whitehead's theory of consciousness focuses on this affirmation.

Consciousness is the subjective form of the feeling which feels the contrast. Thus, the origination of consciousness in experience is as a result of intellectual feelings and it is dependent by degree on the variety and intensity of the feelings.[3] According to Whitehead: "Mental operations do not necessarily include consciousness."[4] In so far as the subjective aim is more of a lure for feeling than something intellectual, feeling is itself the germ of mind. The word 'mind' represents the complex of mental operations as they are utilised in the concrescence of an actual entity.[5] The philosophy of organism rejects the concept of a detached mind. Mental activity is a mode of feeling attached in some degree to all actual entities. It is only in some entities that it attains the level of consciousness.[6] However, consciousness is not necessarily involved in the subjective forms of either kind of prehension. It arises only in the later stages of complex comparative feeling. If this phase is negligible in the concrescence of any particular actual entity, then that entity will not have any knowledge of its experiences.[7] Thus, an actual entity is more likely than not to be unconscious of some part of its own experience, for example, participation in the erosion of a shoreline. The individual experience of the actual entity represents the totality of its 'formal constitution' and this experience includes any consciousness it may possess. So although through the totality of the process of concrescence, consciousness may be achieved, we should recognise that all consciousness includes conceptual feelings in its derivation. Thus, consciousness is not directly involved in the genetic development of the actual entity.[8]

The role of conceptual feeling in the development of mind should be stressed. Mind is based upon feeling rather than simply some concentration of intensity of the mental pole, and so is a possible explanation for the development of life. According to Prof. Emmet, this helps to account for Whitehead's choice of the phrase 'enduring object' to describe people rather than

1.PR p188, 2.PR p53, 3.PR p267, 4.PR p85, 5.PR p85, 6.PR p56, 7. PR p162
8. PR p161.

simply 'person', because that word 'person' is suggestive of consciousness. It is certainly clear that Whitehead wished to avoid the misunderstanding that consciousness is a common commodity.[1] Life is a characteristic of all the living cells in the animal body. An explanation was needed not only the unifying control which enables a semblance of unified behaviour to be recognised by others, which is life, but also for our consciousness of that unified experience.[2]

Prof. Emmet believes that this issue reminds us of the important and different roles of the physical and mental poles of the actual entity. While the physical pole feels other actual entities, the mental pole feels eternal objects through conceptual feelings. The mental pole may be dormant or involved in negligible activity during concrescence. But even in concrescence which does involve the mental pole and conceptual feelings, it is clear that Whitehead did not intend us to assume that these feelings will automatically proceed on to consciousness. A conceptual feeling is first and foremost a feeling of an eternal object which introduces a new possibility or novelty into the concrescence.[3] Prof. Emmet questions whether Whitehead was really justified in describing both conscious and unconscious feelings of eternal objects as 'conceptual feelings'.[4]

According to Whitehead, the height of consciousness is discovered in negative perception when through the subjective form there is feeling of the contrast between theory, which may be mistaken, and fact, which is 'given'. Conscious perception may be described as the most primitive form of judgement. Whitehead illustrates this by reference to the way in which we establish the colour of a stone. It is the feeling of the negatives concerning the colour of the stone which establish what it is not, and that establishes its true colour of grey. In the case of the stone not being grey the conceptual novelty is ingressed revealing other possibilities as to the colour of the stone. In a case where the stone is grey, grey is ingressed as a possible novelty and its conformity with actuality 'emphasises' the grey. Whitehead describes the negative percetion as the triumph of consciousness. Its peak is in the ability of the mind to employ free imagination in which conceptual novelties search through the universe for concepts with no dative exemplification.[5] Consciousness commences in germinal form with the selected elements of lure, as felt opposites. These begin to generate purposes which subsequently result in satisfaction. This satisfaction modifies the efficient cause, but it is when the contrasts and the identity of those

1.PR p34/5, 2. PR p108, 3. (Dorothy Emmet, 1966, p146)
4.(Dorothy Emmet,1966, p147) 5.PR p161.

themselves felt, that consciousness is established. It is more than simply holding a theory, for it is the contrast of theory against fact. The process operates regardless of whether the theory is correct or not.[1]

According to Donald Sherburne, it is because in Whitehead's scheme experience is not restricted to conscious experience but permeates all reality in some primitive form through prehensive activity, that all reality is subject to the Categories of Obligation, not simply conscious human experience. Hence, consciousness, with adversion, purpose, valuation and the like, is akin to the 'subjective form'.[2] But according to Dorothy Emmet, the operation of the subjective form is an extremely important notion at the heart of the philosophy of organism, for it means that all prehensions involve abstraction.[3] Thus, because what is prehended depends upon the subjective form, its role in concrescence grows in importance.

The relation of Propositions to the actual world is important for consciousness, for they may be conformal or nonconformal, true or false. The adoption of a nonconformal proposition into feeling results in novelty emerging into creation. According to Whitehead, to consider a nonconformal proposition merely as wrong in a judgmental situation, is fatal to the development of an understanding of its true role in the universe,[4] and fails to recognise the primary role of the nonconformal proposition in the advancement of the world into novelty. Can there be progress without error?[5] According to Whitehead, the main function of propositions has in fact been clouded by an emphasis by logicians on their judgmental role between truth and falsehood, a belief which has obscured their role for feeling at an unconscious level.[6] He cites Bradley, philosopher and logician, as an example of one who does not distinguish between propositions and judgements, resulting in the neglect of propositions.[7]

Whitehead's doctrine is that 'judgements' are uncommon in the realisation of propositions, as also is consciousness. He illustrates his case, that judgements concede to aesthetic pleasure, by suggesting consideration of classic literature and the New Testament, in which it quickly becomes apparent that attention is diverted almost at the outset from 'judgement to aesthetics. Hamlet's speech becomes mere 'lure for feeling'.[8] Matthew V, even judged by a Christian, would be

1.PR p188 (Whitehead likens it to Locke's 'knowledge of ideas'). 2. (Sherburne, 1966, p42)
3.(Dorothy Emmet, 1966, p95) 4.PR p186, 5.PR p186/76, 6.PR p184, 7.PR p259, 8.PR 184.

considered as elements of value in feeling rather than as true or false. This would be impossible if the primary function of propositions was judgmental.[1]

Prof. Dorothy Emmet stresses the importance of recognising that propositional feelings are not restricted to conscious mentality. If consciousness is derived from physical and conceptual feelings when the conceptual feeling is in the form of an affirmation / negative contrast, this is to emphasise the non-conformal element of the judgement of mentality.[2] Emmet believes that it could appear from this that Whitehead is advocating the importance of interest over truth. Her interpretation is that in some cases the claim of a truth in a proposition adds interest and in others it does not. She contrasts Whitehead's examples from Shakespeare and the New Testament with the sentence: "An elephant is in the room". The importance of this statement is highly dependent upon its veracity.[3] Similarly, any attempt at a reconstruction of history is regarded as significant by the degree to which it is based upon the desire to convey what actually happened. Truth and falsehood originate from the integrations of eternal objects as possibilities and as actual fact. Thus, a judgement may be either correct, incorrect or suspended. Suspended judgements are important in both science and philosophy.[4] Her reasoning implies that she feels that Whitehead may not have taken sufficient cognisance of these fact.

It appeared to Whitehead that in practice, at least as far as human beings were concerned, consciousness is never acquired by simple physical feelings, only by transmuted feelings.[5] The description of transmutation above explains how humans, as representatives of 'conscious' beings, prehend the world.[6] It is the intensity through the force of repetition which makes this 'transmuted perception' the dominant type of feeling, which through further and continued integration develop 'consciousness' as an attribute of their subjective form. Consciousness is the result of a simplification of physical feeling which is produced in the course of integration. Awareness of our own consciousness only becomes apparent when we first become aware of other and different mentalities. Only then can we be regarded as approximating to: "...the conscious prehension of a single actual entity."[7] Through such a description degrees of consciousness can also be explained, for example, in sleep or under sedation, a lower intensity and repetition accounts for a lower grade organism. All the different forms of energy which 'flow in

1.PR p185, 2.(PR p396) 3. (Dorothy Emmet, 1966, p166) 4.(Dorothy Emmet, 1966, p167).
5.PR p236, 6.PR p253, 7.PR p253.

upon it' in their varieties and detail are simply received and transmitted, but are not sorted to produce an intelligible system.[1] Adversion and aversion only have significance, as does the category of transmutation, in the case of high grade organisms. These constitute the first step towards what Whitehead describes as an 'intellectual mentality', although he notes that alone they do not constitute consciousness. They are the first steps towards it, in so far as the process towards consciousness requires the ability to isolate and fuse the intensity and repetition of physical feelings.[2] According to Whitehead, this account appears to fit our experience of the facts of consciousness.[3]

Whitehead's description of the development of consciousness through the transmutation of physical feelings, Category of Explanation VI, through which the animal body can prehend the world, comes under serious scrutiny by Ernest Wolf-Gazo. The intensity of a transmuted perception is increased by repetition, enabling the dominant type of feeling to integrate and develop into consciousness, which then becomes an attribute of the subjective form. In this context consciousness may be summarised as being the result of a simplification of physical feeling which is produced in the course of integration. Wolf-Gazo believes that Whitehead did not deal adequately with the problem of consciousness and perception. He failed to explain how consciousness becomes perception. Whitehead proposes different prehensions which he does not formally categorise.[4] But according to Wolf-Gazo, categorisation could be achieved relatively easily, for example, into the Primary, which would be the simple, positive, unconscious or 'blind' perceptions, the Secondary, which would be the conceptual, negative and conscious or intellectual prehensions, and the Tertiary, which would be the synthetic, the transmuted hybrid and the 'Gestalt' or intuitive. These would be collectively regulated under the Category of Obligation.

Wolf-Gazo's argument is that if such a scheme of classification were constructed, it would lead to the recognition of the need for an equivalent in Whitehead's philosophy to that in Kant's, which caters for the transcendental aesthetic experience. Only with such a construction can Whitehead's scheme account fully for the 'self-consciousness' aspect of consciousness. Had he placed consciousness more centrally in his epistemology, rather than as a derivative, this omission would have been more readily apparent. Wolf-Gazo believes that Whithead's epistemological scheme is firmly founded upon sense-perception, which is for Whitehead simply a higher phase of being

1.PR p254, 2.PR p254, 3.PR p85, 4.(PR p153).

aware of the world. This does compensate to some extent for the omission, but according to

Wolf-Gazo, to include transcendental prehensions would complete the scheme, that is, if they are possible within the scheme.[1]

Percy Hughes, in an earlier paper and using different language, addresses a similar point in so far as it concerns perception and the awareness of the world. His concern is with conscious and unconscious feeling. As neither the mental nor the physical process need be conscious and so many of the feelings are unconscious,[2] we are led to the question of what effect this has on the analysis of positive prehensions or feeling when they are related to observation, for we can only remember feelings which have been conscious. He questions whether it would be possible to apply a method of introspection, as in the case of psychiatry? Such introspection could be deemed to be 'imaginative thought' and not the unconscious feeling of perception, without suggesting that the introspections are false. The question which is unanswered is whether Whitehead's descriptions of introspection and emphasis on the selective nature of consciousness[3] with the cognitive qualities associated with the mode of causal efficacy, can be compensated for by the addition of a self -correcting element of experience through a self education phase in the duration of individual people.4 In other words, according to Hughes, what is lacking in Whitehead's description of consciousness is an element which can account for the effect of consciousness on the conscious self. This discussion leads to a similar solution to that offered by Ernest Wolf Gazo who is dealing with a similar difficulty. Both are recognising an omission or incompleteness in Whitehead's description of consciousness, Wolf-Gazo relating it to transcendental experience and the need for a transcendental prehension which can account for self-consciousness, and Hughes to the role of the unconscious as investigated by psychiatry. To summarise, consciousness arises from the integration of propositional and conceptual feelings which form an 'affirmation negation' contrast, which is the negative judgement of mentality.[5] It is through this operation of judgmental choice that particular forms of definiteness are formed.

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1. Ernest Wolf-Gazo, Are Transcendental Prehensions possible? Kortrijk / Lille, April 1st & 2nd.,1997, p2. (Unpublished)
Wolf-Gazo refers to other Papers which would prove helpful in this discussion which include his own: 'The Prehending Subject', especially Ch. 10 'The Inversion: Whitehead and Kant', pp355-380, the English version available at the Leuven Whitehead Documentation Centre; the German version to be published by Lang Publications 1998; and also his: 'Whitehead and Berkeley', 'On The True Nature of Sense Perception', in: Whitehead's metaphysics of Subjectivity, Ed. E Rapp and R Wiehl, Sunny Press 1991, p21-33, the German version published by Alber Verlag, Freiburg 1991, p33-45. 2.(PR 256), 3.(PR 27), 4.(Schilpp,1951, p290/1) 5.PR p267.

Some alternative forms of definiteness are rejected thereby implying that they are envisaged by the actual entity in the decision.[1] This provides for the possibility of consciousness. It is when such actualised types of structure recur that a novelty may develop, with the grasp of art, aesthetics, literature or morality which had previously not been envisaged. It is these intellectual feelings which lead to consciousness.[2]

In his description of the nature and origins of consciousness Whitehead has presented his solutions to questions which arise from the classical presentation of the mind / body problem,[3] through the development of the doctrine of conceptual feeling in the later phases of concrescence of the actual entity. These solutions involve new doctrines related to perception which also challenge the traditional doctrines of perception, and the notions of other philosophers, especially Hume and Kant, on perception, who conceive the order of development to be consciousness first and experience second.

Summary

We first established the notion of a living society. This was discovered to depend upon three major conditions, first that a society is able to sustain itself and become stable over a duration. Second, that some application of 'initiatives' of appetition occur, which means that the mental pole of each concrescent occasion is able to convert novel elements into a single subjective aim. The third stage may be either progression to life or the termination of the initiative, which Whitehead refers to as a 'random adjustment' to blend with the ideal harmony of the whole through aesthetic adjustments. The result is lower organisms producing an 'inorganic' society. In higher organisms there is a development of the diverse experiences with a reaction against external forces which would disrupt the balance and direction of the new aim. Societies responding in this way are called 'living societies' where life is by degree. Such societies are called 'organic' societies. Other factors include the interweaving nature of the pattern in the nexus and the protection the inorganic societies can provide for the organic. This relationship is referred to by Whitehead as that of 'psychological physiology' and 'physical physiology'.

Whitehead's states that consciousness arises from the integration of mental and physical feelings so that there is a contrast between realised fact and the possibility of fact. Its origination is the result of intellectual feelings in the developmental phases of the actual entity and is dependent

1.PR p166, 2.PR p146, 3.(See Chapter I, Section 2)

upon their intensity. At such a phase the selectivity of data from the world from which it arises is enhanced. The dependence of the actual entity upon the subjective form which guides the way in which it prehends the world is crucial. The developmental nature of consciousness determines that consciousness is by degree.

8. Perception, the application of Psychology and Physiology in the Philosophy of Organism

In this section we will first consider Whitehead's reasons for describing the empiricists' doctrine of perception as inadequate, with special reference to its presentation by Hume, followed by the alternative doctrine of perception proposed by Whitehead in the philosophy of organism based upon 'prehensive unification'.

In the presentation of his theory of 'perception' Whitehead makes it clear that its adoption also entails the rejection of the sensationalist doctrine of perception which has been dominant since the 17th Century.[1] Hume confessed allegiance to the philosophical norm of his day that: "...To hate, to love, to think, to feel, to see; all this is nothing but to perceive."[2] For Hume these emotions and activities are nothing other than perceptions derived from mental impressions. In rejecting the rigid distinction between particulars and universals which was the foundation of that doctrine, Whitehead was rejecting what he believed had been the error which had caused it, without giving sufficient consideration to the contribution of the mind of the percipient to the sensation.[3] According to Whitehead, within philosophies constructed by empiricists, for he believes that this dogma was also in Locke's mind, there appears to be confusion between both an 'idea' as an act of consciousness with the content of the idea, and also between an idea described as an 'impression' and the notion of ideas as reflection: "One difficulty in appealing to modern psychology, for the purpose of a preliminary survey of the nature of experience, is that so much of that science is based upon the presupposition of the sensationalist mythology."[4] To ascribe all emotional content to the idea or impression and to deny the contribution of the mind to perception, is contrary to the doctrine of the philosophy of organism, as outlined below.

We see that the starting point of Hume's philosophy of perception was the obvious assumption that things perceived are not literally in the mind as things, but only the perception or ideas of them. But in developing Locke's analysis of knowledge of the world, he divided Locke's notion of an idea into 'impressions' or 'ideas'. This

1.PR Pref.xiii, 2. PR p146, 3.PR p146, 4.PR p141.

division was based upon the force or liveliness with which they entered the mind, the more lively sensations, passions and emotions were the impressions, while the less forceful faint images of things in thinking and reasoning were classified as ideas.[1] Thus, sense perception based upon vision and touch were impressions not ideas. Hume also introduced a division in both categories of either simple or complex, with a view to establishing the fact that all simple ideas are derived initially from the simple impressions which correspond to them. Thus far Whitehead is content with the description. It is when Hume commences upon his description of complex impressions that Whitehead takes exception, accusing him of losing the clarity of description which has been his hallmark. He has failed to distinguish between first, the way, or order, in which the many simple individual items perceived constitute a complex perception, whether that be impression or ideas; second, the originating causes which lead to the complex perceptions and third, the multitude of simples which constitute a complex perception in some definite manner. However, Hume does suggest that there is evidence for believing that ideas are not entirely loose and unconnected and that there is some form of bond between them, emanating from the fact that they appear to associate on a regular basis and become complex ones. According to Hume, this 'uniting principle' is to be considered neither as designating inseparability nor a limitation upon imagination and the joining together of ideas. Nothing is more free than the faculty of the mind. The uniting principle is a gentle force in which nature guides simple ideas into a complexity.[2]

Finally Whitehead notes Hume's notion of a substance as: "...nothing but a collection of simple ideas, that are united by the imagination, and have a particular name assigned to them, ...".[3] This appears to establish the nature of a substance succinctly, until later on in the same passage Hume introduces detail as to how the differences between the quality of ideas can be accommodated in the notion of their union in a single substance. He refers to a 'principle of union' which enables the fusion of earlier and later qualities to form part of the complex as they occur. Whitehead regards this aspect of a 'principle of union' as in conflict with the earlier description of substance as 'nothing but a collection'.[4]

1.PR p130, 2.PR p131, 3.PR p131(Hume's Treatise Bk.I, Part I, Sect.VI) 4.PRp132

Combining these different notions of Hume concerning ideas, impressions and substance, Whitehead finds difficulty in equating the manner of the composition of complex ideas or impressions, if the manner is not itself an idea, for otherwise another 'manner' will be required to account for the new complexity and so on, ad infinitum. Thus we are left with a choice between either a simple idea or a vicious infinity. But as Hume has already conceded that there can be novel compound ideas which are not direct replicas of compound impressions, according to Whitehead he ought to be able to agree that: "...there is a novel simple idea conveying the novel 'manner', which is not a copy of an impression."[1] This appeal is in the light of Hume's own exception made regarding a missing shade of a colour.[2] The introduction of exceptions by Hume, to his own original proposition that 'simple ideas are all copies of simple impressions', means that it dies the death of qualification. According to Whitehead, presented in the way by Hume, it can hardly be regarded as an ultimate philosophical principle. Having stated that nothing is more free than imagination Hume has immediately limited imagination to the production of novel complex ideas, discounting any value to his exception of the missing shade of colour. Whitehead concludes that Hume's treatment of imaginative freedom is extremely superficial.

Another point over which Whitehead expressed concern was Hume's contrast between 'simplicity' and 'complexity'. He questions whether it is not true that simplicity is a relative term judged in relation to some specific standard of measurement. If so, we should reject Hume's description of perception which so limits imagination, by freeing it from all conceptual production, explained in the philosophy of organism through the activity of eternal objects. If we agree that there is no such thing as absolute freedom then we can more easily accept the notion of the freedom of an actual entity poised at the first phase of concrescence, recurring as a limitation only from its own standpoint relative to the remainder of the universe: "Freedom, givenness, potentiality, are notions which presuppose each other and limit each other."[3]

1.PR p132, 2.PR p86/7,
Hume had envisaged a person being able to recognise a missing shade of a colour, not experienced previously within the shades of the spectrum of that colour, simply by its absence, the so-called, 'missing shade of blue debate'. Whitehead suggested that to recognise such an exception in the case of colour, could reasonably imply that we should expect exceptions to sound and other senses of experience. 3.PR p133.

According to Whitehead, Hume has related feeling intimately to sensation and suggested that feelings are by necessity derived from sensation, but according to Whitehead, this is to fail to recognise that generally feeling is a secondary effect of sensation. The opposite can be the case when emotion denies sensation, associating itself strongly with an idea. To suggest that all our impressions of other data are confined to sensation is 'pure myth'. The opposite doctrine is nearer the truth: "...the more primitive mode of objectification is via emotional tone, and only in exceptional organisms does objectification, via sensation, supervene with any effectiveness." Only in higher organisms does sensation operate through perception with any degree of effectiveness. The doctrine of the empiricists lacks both reasoned thought and empirical evidence.[1]

We are now more easily able to understand why to accept the doctrine of perception in the philosophy of organism is to reject the sensationalist doctrine of Hume. To summarise the new doctrine we must divide perception into two kinds, the 'cognitive' and the 'uncognitive'. The former is comprised of the pure mode of 'presentational immediacy'. The second mode of perception, that of 'causal efficacy', is 'uncognitive' and is referred to as apprehension or 'prehensive unification'. Whitehead described the daily experience of conscious perception of ordinary sense objects as being in a mixed mode of 'symbolic reference' which is the interplay between the other two modes.[2] An entity of which we are aware in the terminus of sense perception is described as a 'sense-object'. These may be in the nature of a shade of a particular colour, a sound of a particular quality and pitch, a definite scent or a particular quality of touch. According to the philosophy of organism, to perceive such objects is to sense their 'ingression' into space-time, where 'ingression' denotes the means by which eternal objects enter into the concrescence of the actual entity. Whitehead regards this as akin to Plato's concept of 'participation'.[3]

Whitehead developed the notion of a prehensive unity of volume from his doctrine that a volume is the most concrete element of space. On analysis, a volume is found to be an indefinite number of sub-volumes, for any volume we may select is discovered to be

1.PR p141, 2.PR p121, 3.PR p122.

simply a multiplicity of non-voluminous elements of fact.[1] But for perception, a volume is the ultimate act of experience. So a prehensive unity is an ordered aggregate of contained parts. The discerned order stems from the fact that each part owes its significance to the standpoint of every other part. Whitehead uses the language of Leibniz to describe this as: "...every volume mirrors in itself every other volume in space".[2] However, he rejected the terminology of Leibniz in his division of types of perception, because both 'perception' and 'apperception' retain some suggestion of cognition.[3] He followed the lead of Francis Bacon in differentiating between sense awareness of a perception, and perception without sense or knowledge, and was thus able to avoid the word 'perceive' completely. He gave the term 'apprehension' to sense awareness with cognition, and 'prehension' to the uncognitive apprehension.[4] He discovered a precursor to the concept of a prehensive unity in Berkeley's contention that the realisation of things, or natural entities, are the result of their being perceived within the unity of mind. According to Whitehead, we can transpose this notion into the language of the philosophy of organism, thus: "We can substitute the concept that the realisation is a gathering of things into the unity of a prehension; and that what is thereby realised is the prehension, and not the things."[5]

The important aspect of this description is that it is what is realised or perceived which becomes the totality of the prehension and not any single item alone. Hence the description of a prehension contains the notion of the 'here' and 'now', so that whatever is taken up into that unity is also recognised as having important references to other places and other times. The description of mind as conceived by Berkeley has become, for the philosophy of organism, a process of prehensive unification[6] According to Whitehead, the result is a description of concrete fact as process. This process can itself be analysed into 'an underlying activity of prehensions'. Each individual prehensive event is a 'matter of fact' which emanates from an individual substratum of activity in which 'individual' does not mean 'substantial independence'.[7]

To apprehend a sense-object is to be aware of the prehensive unification of various

1.SMW p80/81, 2.SMW p81, 3.AI p233/4, 4.PR p121, 5.SMW p87, 6.SMW p87. 7.SMW p88.

modes of different sense objects, which will also include the particular sense-object in question. The 'mode' of a sense-object is the particular standpoint of perception.[1] A 'standpoint' is described as a volume of space through a duration of time, hence it may also be described as a unit of realised experience. Whitehead states that he is simply describing the way we do actually perceive. It includes the awareness of different sense objects such as colour, in particular modes. The mode may be a shade of the colour, such as green in a leaf or its reflection in a mirror. These sense objects will be manifest in a particular location with others, which together make up the unity of the perceived volume, hence: "Perception is simply the cognition of prehensive unification; or more shortly, perception is cognition of prehension."[2] We are reminded that as far as the first consideration of the modal ingression of sense-objects relates to both space and time in the locus of the event, linking space and time as 'space-time' will tend to obscure the true nature of prehensive unification. Whitehead has established that space and time do not have the same relationship to objects.[3] According to Whitehead, keeping the distinction should assist in maintaining a sense of satisfaction in a provisional realism which describes nature as 'a complex of prehensive unifications'.[4] Individual items retain their identity even though they cannot be wrenched from their context. Each one includes the reality of the total complex while at the same time contributing to the nature of the totality. "Hence nature is a process of expansive development, necessarily transitional from prehension to prehension."[5] It includes elements of both 'passing beyond' and 'retaining' within it. It is a process of evolving processes where reality is the process.[6] It is also a rule of the philosophy of organism that any perception of the actual world is expressed in conjunction with the recognition that perception is with the body, making the body the starting point of our environment, of which the body is a part. It is absent from the philosophy of both Descartes and Hume, because they failed to recognise the importance of retaining the concept of the body as the perceiver and are content with presentational immediacy only.[7] In this mode of perception there is a clear conscious awareness of the extensive relationship of things of the world, i.e. of the extensiveness of space and of time. In this mode the perceiver consciously prehends the world.[8]

1.SMW p88, 2.SMW p89, 3.SMW p80 & PR p61, 4.SMW p89, 5.SMW p90, 6.SMW p90, 7.PR p81, 8.PR p61.

However, it is the awareness of the presence of the body that provides us with our knowledge of causal efficacy.

Whitehead criticises philosophers for having neglected information concerning the nature of the universe available through the feelings of the viscera of the body. Concentration has been mainly upon visual sensations, especially by Descartes and Hume who reduce perception to seeing with our eyes and tasting with our palates.[1] Whitehead accuses Hume of reducing causal efficacy to a consciousness of impressions of the world.[2] A subsequent step, which may be unavoidable, would be to reject our belief in the actual world of things which we perceive completely.[4] According to Whitehead, seeing a grey stone is more than simply a mechanism of sight and more than a mere sense of geometrical relatedness to a contemporary spatial region, mediated to us by the sensation of the grey.[4] An explanation of 'causal efficacy' requires an account of the part played by memory and bodily viscera. At the macroscopic level, it relates to the position of the human body in our experiencing of everyday life and certain psychological qualitative excitement in the cells of the body. It also involves the antecedent functioning of the body and its bodily states.[5] From his analysis, Whitehead concludes that the most basic form of physical experience is that of 'blind emotion'.[6] Donald Sherburne sums up causal efficacy as: "...the more primitive and fundamental of the two pure modes of perception"[7] It does not involve cognition or life, but it is present in every actual entity of every kind including those that are considered as associated with inanimate objects.[8] Thus the unique contribution of the philosophy of organism resides in the mode of causal efficacy. The term 'prehension' is understood in connection with Whitehead's doctrine of 'Causal Efficacy'.[9] This doctrine insists that: "...in human experience the fundamental fact of perception is the inclusion, in the datum, of the objectification of an antecedent part of the human body with such-and-such experiences".[10] A survey of the involvement of the bodily senses in perception provides evidence that it is the various bodily organs which transmit their experiences through the appropriate channels for interpretation.

General acceptance of the notion that the living body is to be interpreted by reference

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1.PR p122, 2.PR p122, 3.PR p123, 4.PR p121, 5.PR p126,
6. PR p127, 7. (Sherbourne 1966, p208) 8.PR p58, 9.PR p61, 10.PR p118.

to other sections of the physical universe suggests that the reciprocal, i.e. that sections of the universe are to be interpreted by reference to what we know of the physical body, should also apply. On this basis, in the technical language of electromagnetism, we may conceive of the human body as a 'complex amplifier' which enhances the signals on the way to the place of final integration. So 'inheritance' is the better description of direct perception and of the way in which there is ' feeling-tone' acting as a vector carrying evidence of its origin. This vague feeling-tone in the higher grades of perception differentiates itself into various types of sensa, such as touch, sight or smell, etc. Each one of these is then transmuted into a definite prehension by the final recipient of tone in a contemporary nexus.[1] Consideration of perception in these two pure modes is essential for the proper explanation of the nature of perception, but also it is essential in order to understand the philosophy of organism. Too often ordinary philosophical description has been almost wholly concerned with the unravelling of the interplay between them.[2]

Thus, according to Whitehead, it is equally possible to arrive at an organic conception of the world by commencing from physiology and psychology as it is from the notions of modern physics. Mathematical physics commences by presuming an electromagnetic field of activity which pervades space and time. That does not present a problem to the philosophy of organism which regards the laws which 'condition' this field as simply a description of the: "...general activity of the flux of the world as it individualises itself in the events."[3] But physics makes an abstraction when it fails to include in its reckoning the nature of what a thing is in itself, i.e. when it considers its entities merely in respect of their intrinsic reality. Whitehead re-phrases that as: "...in respect to their aspects in other things."[4] Attention has in fact been confined to these aspects in 'other things' which are regarded as modifying the 'spatio-temporal' relations of other things during their life-histories. It is true that the reality of an individual is appealed to but information is limited to what is selected by an individual observer. The individual observer is only relevant in so far as it is through the observer that the 'self-identical' characteristics of the physical entities are established. They

1.SMW p188, 2.PR p121, 3.SMW p190, 4.SMW p190,

only establish the path in space and the life-histories in time of the objects as enduring entities.[1] Thus it appeared to Whitehead that the contemporaneous scientific scheme lacked any attempt to provide an explanation of the very elements from which the psychological experiences of mankind are made, nor did it provide a rudimentary framework for an explanation of organic unity as a whole.[2]

The effect of the rise of physiology, according to Whitehead, was to put mind back into the debate concerning nature, not as an addendum or after thought to be accommodated by an ad hoc doctrine such as Vitalism, but in its own right. Mental cognition is regarded as the reflective experience by the perceiver of the totality perceived, recognising for him/herself that one unity received: "This unit is the integration of the sum of its partial happenings, but it is not their numerical aggregate. It has its own unity as an event. This total unity, considered as an entity for its own sake, is the prehension into unity of the patterned aspects of the universe of events."[3] The 'prehension into unity' referred to by Whitehead is the coming together and the picking up of the entire pattern of aspects available to the perceiver. The perceiver is aware of his/her own participation as a result of the perception of aspects of the other things which are prehended, i.e. there is a mutual relevance between the perceiver and what is perceived such that the other aspects of things are mirrored in the body of the perceiver. Thus the knowledge of the world of the perceiver is via a mutual relevance through which it recognises itself, i.e. through the things mirrored.[4]

Still focusing attention on the body, Whitehead wishes to differentiate between the bodily event, which is the enduring person, and the enduring bodily pattern. Such a differentiation is similar to that which can be made between parts of the bodily event and the total event, which is the body. Each part of the bodily event has its own pattern, which is itself part of the total bodily pattern, so that collectively each is contributing to the total bodily pattern. The different parts are in fact the environment for the total bodily event. The total bodily event displays a sensitivity such that the stability of the bodily pattern is preserved as the parts adjust themselves for the benefit of the whole. This reciprocal activity is significant, for it represents an example of the

1.SMW p190, 2.SMW p79, 3.SMW p184, 4.SMW p184/5.

general principle of the relationship of the part to the whole, a concept vitally important in the philosophy of organism. The body: "... is a particular example of the favourable environment shielding the organism."[1]

In consideration of the role of the electron in chemistry, Whitehead suggested that each molecule in the body appears to relate its activity to the aspect of the body in which it is situated. The question for science is whether molecules in living bodies differ in any substantial way from those outside the body.[2] Experience of both the activity of the self preservation of the body and the presence of a will in the body, suggest that there are modifications in the body which are the result of the pattern of the body. Although Whitehead could conceive of scientific laws which would describe this relationship, it is equally possible that the direct effects of the whole body to its parts, and vice versa, could be negligible. Conversely, the effects of the total pattern could be transmitted down through the series of parts to the level of the cell. This would focus our questioning onto the level of the physics of the cell, thus illustrating the close relationship of physics to physiology and psychology as well as to biology.[3]

Whitehead offers an example of the principle involved from physics, in so far as an electron in the body will behave differently from one which is outside it. On the same basis, the former acts within the total plan of the entire body because it is within the body. It does not simply run blindly. On the contrary, it runs in accordance with its character of being within the body. Such a plan includes the mental state, for the word body is not intended simply to represent a human or animal body, just as the meaning of the word 'society' does not represent something confined to a human or animal construct. What is being outlined is a description of that which applies at every level of concrescence,i.e. the bringing together of different aspects into a unity. Whitehead's doctrine is that the thing or entity which has duration and which functions in such a way that the overall plan

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1.SMW p185, 2.SMW p185/6,
Modern Science informs us that all the atoms of which life is comprised were formed at some time in a star, as were those of Carbon, Iron and the heavier elements.
Abell, Morrison, Wolff, Realm of the Universe, Saunders College Publishing, Fourth Edition, 1988, pp371-387. 3.SMW p186.

of the organism influences the individual parts of the totality, is an organism. These functions occur in animals in such a way that the mental state influences all levels of organisms down to the last electron. Hence, Whitehead's affirmation that an electron within the body will behave differently from one outside the body.[1]

From such examples drawn from science and metaphysics we can recognise the significance of Whitehead's statement that there are two meanings to the notion of 'organism' as it is applied within that philosophy. One relates to the microscopic and the other to the macroscopic. The former is concerned with the way actual entities are involved in the composition of 'unities of experience' which are the actual entities. The microcosm is the level at which the conditions occur for the conversion of what is merely real into determined actuality.[2] The level of the macro is concerned with what is the nature of the world, discovered as 'given'.[3] It is the level at which things having achieved the status of actuality are in transition to the 'merely real'. Process at this level enables the transition from actual to merely real, providing the conditions for what is achieved. Thus, at this level, process controls achievement.[4]

The entire concept of organism combines with that of process in two ways. First, the community of the actual world is an organism which is in the process of completion, hence the first meaning of process is the expansion of the universe in terms of actual things. Further, the first meaning of organism is also the universe considered at any stage of its expansion, where the meaning of 'organism' is that of a nexus. Secondly, the actual entity can be described only in terms of an organic process: "It repeats in microcosm what the universe is in macrocosm."[5] It also proceeds from phase to phase, each one being the base from which the subsequent phase develops and moves towards completion. The reasons why actual entities are what they are is determined internally, which, in reality, is implied from the preceding actual entities, for it is from them that each one comes.[6]

1.SMW p98/9, 2.PR p214, 3.PR 128/9, 4.PR p214, 5.PR p215, 6.PR p215.

Whitehead summarises by stating that the underlying activity may be envisaged as being constituted by three different elements, the first being eternal objects, the second the potentiality for value as derived from the eternal objects and the third the inclusion of the matter of fact which is an essential element, involved as a result of the possibility of a future. Abstracted from actuality, aspects of the eternal objects cannot impart value.[1] Thus perception is concerned with enduring objects, the variety of which is determined by the characteristics of the internal pattern of the entity. They will vary between those which are only just differentiable from the energy of the substratum, to those which involve conscious thought and self-consciousness. There will also be examples of an intermediate nature without consciousness, which concentrate upon the prehensions of their antecedents, with no innovation.[2] Whitehead describes perception as simply: "...the cognition of prehensive unification; or more shortly, perception is cognition of prehension,"[3]

He refers to the enduring entity, of which we are aware in perception, as 'sense-object'. This may be a colour such as green, in so far as green is in the actual world. Its recognition may be in a green leaf or the reflection of the leaf in a mirror.[4] In either case the sense object is simply a description of what we do perceive. Each sense object may be perceived in a particular mode as expressed in any particular location. Further, each volume of space includes in its essence all volumes of space and each lapse of time all lapses of time, thus:

> "The actual world is a manifold of prehensions; and a 'prehension' is a 'prehensive occasion'; and a 'prehensive occasion' is the most concrete finite entity, conceived as what it is in itself and for itself and not as from its aspect in the essence of another such occasion."[5]

This is to say that the actual world is a process of entities, which are occasions taking up characteristics of value and quality one from the other, and that these occasions of entities, with the process, represent the fundamental concrete reality of the created order of which we are a part. Thus we may regard it as 'provisional realism' to describe nature as: "...a complex of prehensive unifications."[6] The interlocking scheme of prehensions is demonstrated through space and time.

1.SMW p132, 2.SMW p133, 3.SMW p89, 4.SMW p88, 5.SMW 89, 6.SMW p90

It is a doctrine of the organological philosophy that it is not possible to remove any one of them from its context, where only it has the reality of the complex of its environment. Conversely, the totality has its reality on account of its constituent prehensions. This is the basis on which nature can be recognised as being a process for ever in transition, in which the present is always passing beyond its antecedent present while retaining aspects of its past which it takes into itself. Nature passes from prehension to prehension, and may therefore be describes as an 'evolving process' where 'reality' is the process.[1] The word 'event' simply means a spatio-temporal unity with a present, in so far as it mirrors the world of its immediate contemporaries, a past in that it mirrors modes of its predecessors, and a future, in so far as the present determines the future.[2]

Whitehead describes this scheme as being more concrete than a scientific scheme, for it commences where according to an empiricist it should, from the psychological field of our perception. In this description, perception is self knowledge of a bodily event which perceives a unification of sense objects other than itself. The bodily event is distinguished by its complexity and stability of pattern. It is Whithead's belief that by starting our observations in this way we are inevitably led towards the organological concept of nature.[3] This description is understood, within the philosophy of organism, as part of a wider description by Whitehead concerning what he describes as: "...a thoroughgoing organolgical theory of nature with its underlying activity".[4]

Victor Lowe suggests that the whole theory of perception in PR suffers from a confusion, not simply on account of certain aspects of the doctrine, but because of what was introduced in Whitehead's earlier study of the causal nature of physical prehensions. According to Lowe, in that study Whitehead stated that the perception of sense data was an act of 'physical imagination' in the most general sense of those words, and that it was a useful act because it referred symbolically to causal actualities.[5] From this has developed the main problem which relates to the third mode of perception, that of symbolic reference. The fusion of the two modes of

1.SMW p90, 2.SMW p91. 3.SMW p91/92, 4.SMW p132,
5.Victor Lowe, 'Whitehead's Philosophical Development', In: (Schilpp,1951, page 99)

cognitive perception - causal efficacy and presentational immediacy - into an equality one with the other, has focused attention on how Whitehead can then attribute sensation to the 'lowest grades of existence', i.e. on every existing thing. Lowe suggests that the way the fusion of the two modes is presented in the philosophy of organism could represent a move towards a form of 'panpsychism', which is the most general way of overcoming the problem. However, the question would still remain as to why, if sense perception is not a 'metaphysical characteristic', a form of perception is attributed to everything that exists?[1]

According to Lowe, the justification of the philosophy of organism demands that an 'epistemological realism' is dominant and this in turn demands a theory of causality where some things are given. If the philosophy were to abandon the phenomenological basis of its theory of perception, it would provide the opportunity of constructing this deeper theory of realism. Experience would then not be just a series of sense data but a reaction to things that exist in their own right. But in regarding these things as imposing themselves on the percipient, we again observe the difficulty experienced by Whitehead, that of successfully formulating a description of perception which can combine satisfactorily an Idealist, Nominalist position with that of a Realist. One can the psychology of inferred constructions in the pre-speculative epistemology be expected to meld with a new epistemology of a realism, described above as 'Platonic Realism', which has an empirical base for its metaphysics. Lowe suggests that both the Platonic and Whiteheadian schemes were constructed with an awareness of the need to maintain the basic distinction in experience between what Whitehead refers to as 'inescapable actuality' and the response of thought to this actuality. This is what produces elements of the doctrines which require definitions.[2]

Prof. Emmet refers to Whitehead's account of perception, where something is going on in the passage of nature, with its creative advance into novelty, as 'data pinned down by attention'. This she contrasts with the traditional concept of

1. Victor Lowe, 'Whitehead's Philosophical Development', In: (Schilpp, 1951, p99/100)
2. Victor Lowe, 'Whitehead's Philosophical Development', In: (Schilpp,1951, p101.)

perception as 'primitive awareness'. Further, the attentive awareness described by Whitehead is not instantaneous but in spells or durations, i.e. as 'a spatio-temporal spread of the contemporary world' from the reference point of a percipient event. What she finds controversial about this description is the way in which this passage of nature comes to receive the interpretation it does concerning the causal efficacy of the patterning activity. We observed earlier[1] Emmet's important question as to how what perishes also remains an element of what is in the new state beyond, for Whitehead insists upon the repetition of a characteristic over a route of events. There is an action of 'carrying over' from one stage to another which is the main concept of causal efficacy. Though there may be partial answers in Whitehead's whole description through doctrines such as 'Extensive Connection' or the repudiation of Whitehead's notions on the 'bifurcation of nature', according to Emmet the main difficulty of interpretation still hinges around the fact that this doctrine was formulated on the passage of nature as based on events.[2] This criticism gives us another pointer as to why it was essential for Whitehead to conceive the essential element of nature as an atomic actual entity rather than the original 'event', with its complications of duration.

According to Percy Hughes, through his psychological doctrine Whitehead has brought the day nearer when the dream of William James, of psychology being taken up into the whole body of philosophy, will be achieved. He has done this by opening up an entrance or corridor to his cosmological scheme through his psychological physiology. Hughes suggests that justification for the inclusion of the value judgements made by Whitehead introduces the need for a predominantly empirical enquiry into the doctrine, which Hughes offers to provide.[3]

Hughes welcomes Whitehead's description of concrescence as representing not only activity related to all physical acts and involved in all physiological acts, but

1. (See Section 5, Side 148)
2. Prof. Dorothy Emmet, Whitehead's View of Causal Efficacy, p166 In: Whitehead and the Idea of Process, Proceedings of the First International Whitehead-Symposium 1981. (Ed. H. Holz and E. Wolf-Gazo) pages 161-178.
3. Percy Hughes: Is Whitehead's Psychology Adequate? In: Schilpp, 1951, pages 275-276.)

also as a structure essential to all conscious and cognitive acts of daily experience. He offers an example of the approach of ominous storm clouds as an illustration of the effects of physical events upon the emotions of the whole body, i.e. as an example of 'perceptual adaptation' as part of the totality of the concrescence of prehensive process. Hughes quotes John Dewey: "It is Whitehead's 'original and enduring contribution to philosophy, present and future,' that he has shown that, 'acts in human experiencing are thus analogous with all acts, physical and physiological, which are involved in natural events'. Hence all acts or 'occasions' in Nature involve the 'private psychological field' of subjective form or 'active tone'."[1]

Hughes demonstrates how all three - physics, physiology and psychology - are used by Whitehead in order to reveal the truth that the key notion from which a cosmological construction such as his own should commence is from the study of both the active energy in physics and the emotional energy involved in the intensity of life.[2] All three disciplines have proved to be part of the total body of philosophy of which Whitehead speaks when he extols the need for self- education and the production of a speculative philosophy of new ideas. According to Hughes, Whitehead balances these with the true method of discovery which starts from a basis of particular observations.[3] 288 Yet it is psychology proper that is eventually recognised as being that true corridor which is both the entrance and exit from any cosmological scheme.[4]

According to Hughes, the majority of the inadequacies in Whitehead's 'psychology' are 'readily explicable' and thus adjustments are relatively easy to make. For example, Whitehead recognises only one kind of conscious perception whereas Hughes finds at least three types, the difference lying in the interpretation of causation as applied to perception.[5] This can be accomodated by a widening of the psychological gateway and

1. John Dewey, "Whitehead's Philosophy", Philosophical Review, 1937, Vol. XLVI, p73, In: (Schilpp, 1951, p278)
2. Percy Hughes: Is Whitehead's Psychology Adequate? In: Schilpp, 1951, pages 280.)
3. Percy Hughes: Is Whitehead's Psychology Adequate? In: Schilpp, 1951, pages 288.)
4. Percy Hughes: Is Whitehead's Psychology Adequate? In: Schilpp, 1951, pages 289.)
5. Percy Hughes: Is Whitehead's Psychology Adequate? In: Schilpp, 1951, pages 293.)

corridor which leads to the total body of philosophy referred to earlier.[1] Hughes makes it clear that he makes these observations out of a genuine appreciation of Whitehead's doctrine of human life and thought. According to Hughes, Whitehead was correct to draw closer attention to the central question of the human body in perception, where the elements of nature are not inert:

> "The significance of the human body in nature is that it focalizes acts of all degrees of creative emphasis, and is a mechanism achieved by Nature for subordinating acts of minimum creativity, acts of routine, to acts of maximum creativity, acts of conscious self-direction toward ideal ends. This interpeetation of the human body justifies the title of the new science Whitehead proposes, **psychological physiology."**[2]

In spite of any errors that there may be in Whitehead's work on psychological physiology, Hughes expresses his faith that it is the means of bringing back together all that we know as humans into the realm of 'empirical, scientific consideration'.[3]

The comments of Victor Lowe suggeste a lack of clarity of explanation by Whitehead concerning the way in which sensation is attributed to the lowest grade of existence. Lowe represents this as a confusion between Whitehead's realm of 'physical prehensions' and an earlier statement by Whitehead concerning perception of sense data as an act of 'physical imagination'. Professor Emmet finds confusion resulting from Whitehead's earlier notion of the event being changed to that of the entity. However, in 'Process and Reality' there may appear to be a lack of clarity between the role of the cognitive mode of perception and the uncognitive. Whitehead has proffered a description of the development of consciousness in the higher forms of enduring objects, but it does not appear to be his intention to exclude the continued operation of the influence of uncognitive perception from enduring objects which achieve consciousness. The act of perceiving a 'prehensive unification' in the pure mode of presentational immediacy is part of the cognitive process of perception. However, according to Whitehead, perception in this mode merely present us with sense data as part of a totality of the vagueness of a contemporary spatial region which has its own spatial shape and spatial perspective from the standpoint of the percipient.[4]

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1. Percy Hughes: In: (Schilpp, 1951, pages 295.)
2. Percy Hughes: In: Schilpp, 1951, pages 296/7.)
3. Percy Hughes: Is Whitehead's Psychology Adequate? In: Schilpp, 1951, pages 299.)

We have to remember that this is what is ordinarily termed as perception, in terms of consciousness of presentational objectification is in the mixed mode of symbolic reference. Consciousness of both types of objectification is possible. "There can be such consciousness of both types because, according to the philosophy of organism, the knowable is the complete nature of the knower, at least such phases of it as are antecedent to that operation of knowing."[1] Thus, inherent in conscious perception is perception in the second pure mode, which is categorised as 'causal efficacy', which implies consciousness of what was otherwise unconscious i.e. what can be known is dependent upon the time and space of the knower for it is that, in terms of the knower's antecedent history which determines what can be known and the antecedent history includes the uncognitive.[2]

This does not affect the nature of perception at the lower forms of existence, termed by Whitehead 'inorganic', but still negates any suggestions of 'panpsychism'. Such a description of perception re-enforces the distinction between conscious and uncognitive perception, an area with which, according to Wolf-Gazo, Whitehead did not deal adequately.[3] However, it offers little help in solving the question of the relationship between consciousness and perception, which resulted in Wolf-Gazo's suggestion for the inclusion of a role for transcendental prehensions, where 'transcendental' means philosophical notions beyond our conscious experience of phenomena and not the theological ones of 'supernatural' or 'mysticism'.

Summary

In this section we considered Whitehead's challenge to the sensationalist doctrine of the empiricists, particularly as represented by Hume. Hume's division of Locke's notion of an 'idea', into 'impressions' and 'ideas', introducing into both degrees of complexity, as well as failing to explain sufficiently clearly the definition of the terms, resulted in an overall loss of clarity in the doctrine. Further, Hume provided little room for the functioning of the mind through imagination. He was found to have linked feeling too closely with sensation and neglected the role of the body in perception, concentrating too much upon visual sensation.

4.PR p121. 1.PR p58, 2. PR p58,
3. (See Section 7, Side 199)

Whitehead's description of perception incorporated three modes, two of which are described as pure modes. First is the cognitive mode of presentational immediacy and second the uncognative mode of causal efficacy. The third mode was the mixed mode of 'symbolic reference' which accounts for the ordinary sense of perception of sense objects. The cognitive mode of presentational immediacy involves the notion of the prehensive unification of volume as the most concrete element of space and the ultimate act of experience. It describes what is realised or perceived in the totality of the prehension thereby involving the 'here' and 'now'. Hence, nature is a process of expansive development in a necessary transition from prehension to prehension. The process is reality and reality is the process. The pure mode of causal efficacy takes account of the involvement of the whole body in the act of perception and the response of the bodily viscera to what is perceived. It requires an account of memory and human viscera. This more primitive of the two pure modes was designated as the unique contribution of the philosophy of organism to our understanding of perception. The mixed mode of 'symbolic reference' demonstrates the relationship between an enduring unity of pattern and enduring objects as sensed objects in. This illustrates the fundamental principle in the philosophy of organism as 'bringing together'.

The involvement of two levels of 'organism' in Whitehead's doctrine of perception was recognised, one at the micro level and the other at that of the macro. The former deals with the way in which actual entities are involved with the composition of our 'unties of experience' and the latter with the nature of the world as a 'given'. These are combined in the general notion of organism which describes the expansion of the universe in terms of actual things and the organic process which repeats in microcosm what the universe is in macrocosm. Thus, perception is concerned with the world of enduring objects constituted by sense objects in different modes and locations, where the actual world is a process of entities.

9. Whitehead's Actual Entity and the Monad of Gottfried Wilhelm Leibniz - A comparison

In this section we will deal with a comparison between Whitehead's philosophy of organism based upon the actual entity and the philosophy of Leibniz based upon his monad. The purpose of the comparison will be to establish the extent to which the two philosophers make use of notions and assumptions which are similar, to ascertain the general similarities in the two philosophies as a whole. In particular we will evaluate the charges made by Whitehead against what he considers to be Leibnizian errors.

In our exposition of Whitehead's philosophy of organism it has become clear from the many references made by Whitehead to certain of his predecessors, that he desired to link his philosophy with 17th Century thought:

> "A more detailed discussion of Descartes, Locke and Hume ..... may make plane how deeply the philosophy of organism is founded on seventeenth century thought and how at certain critical points it diverges from that thought."[1]

However, the concern of the philosophy of organism is usually with the very elements of those philosophies which have been discarded by later developers of systems applying the philosophy.[2] With reference to Kant he states categorically that the Kantian philosophy is the inversion of the philosophy of organism. As Whitehead points out, Kant describes a process by which subjective data becomes the appearance of the objective world whereas the philosophy of organism attempts to justify the very opposite:

> "The **Critique of Pure Reason** describes the process by which subjective data pass into the appearance of an objective world. The philosophy of organism seeks to describe how objective data pass into subjective satisfaction, and how order in the objective data provides intensity in the subjective satisfaction. For Kant, the world emerges from the subject; for the philosophy of organism, the subject emerges from the world- a 'superject' rather than a 'subject'."[3]

Further, the amount to which Whitehead used or appealed to the work of earlier philosophers is not clear, especially in the case of Henri Bergson for example.[4] This whole issue is brought into focus through the consideration of the Leibnizian monadology. Although Whitehead refers frequently to the work of Descartes, Locke

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1.PR p130, 2.PR Pref. xi, 3.PR p88, 4. (See Section 7, Sides 192/3)

Berkeley, Hume and Kant, there are comparatively few references to Leibniz and his philosophy. Not only are references relatively rare, but in Process and Reality they are also not generally complimentary. Yet Prof. Emmet, referring to Whitehead's radical new venture in proposing that the task of the philosopher was to form a 'synoptic metaphysical system', clearly links Whitehead and Leibniz on this matter. Referring to Whitehead she states that:

> "We feel in reading him that in this way he is much closer to the Greeks and Cartesians, perhaps above all to Leibniz, than to most modern philosophers (with the obvious exception to Professor Alexander), and certainly to those of the most recent past."[1]

In view of the shortage of references to Leibniz in Whitehead, recognition of such a closeness must emanate from a knowledge of the two philosophies rather than from directions given by Whitehead himself. However we should also note that closeness in structure does not inevitably mean similarity of content or doctrine. Part of the purpose of this section is to establish such links of content and doctrine.

Whitehead explained that his scheme would attempt to deal adequately with what is universally open to experience. His scheme as a whole would have its rational and empirical sides but there would also be an aspect which cannot be confined into what he refers to as 'immediate matter of fact'.[2] "This doctrine of necessity in universality means that there is an essence to the universe which forbids relationships beyond itself, as a violation of its rationality. Speculative philosophy seeks that essence."[3] This search for and inclusion of the elements of the ultimate which can provide a reason for things, assisted in the formation of the scheme into the shape it eventually took. Thus, at the outset of his scheme, Whitehead explains the relationship between what can be known and what has to be ultimately accepted as given.

With such a description we must compare the characteristics of the Leibnizian. scheme formulated on the monad. Parkinson confirms the nature of the scheme upon which Leibniz embarked when he described the aim of Leibniz as being that of devising a universal symbolism which would be used to describe the systematic character of all knowledge.[4] The attempt of Leibniz to convert a complete classification of his

1.(Emmet, 1966, p8) 2.PR p3/4, 3.PR p4, 4.(Parkinson, 1973. Introd. pix.)

mathematical calculus to a rational scheme, eventually involved him in metaphysics which in turn led him to theology. He then found himself having to construct a 'proof' of God on the basis of the cosmological argument based on 'contingency' to defend his metaphysical system, for his belief was that the primitive concepts are attributes of God. According to Parkinson, Leibniz recognised that establishing how everything is derived from God was not possible, but the derivation of the simple principles from complex ones was. As a result he produced a more modest metaphysical scheme. Hence, we can say that his programme was the result of his belief that searching for the primitive concepts which lay behind nature, would enable deductions to be made about existense.[1] Thus, the aim of the two philosophers was in this respect similar.

However, the Leibnizian scheme revealed itself as not confined merely to metaphysics, being more openly theological than that of Whitehead.[2] It was out of the search for the simple principles that the important doctrines of Leibniz concerning substance developed. According to Parkinson, it was in order to describe and explain the nature of substance more fully, that Leibniz wrote 'On the Ultimate Origination of Things', commencing his writing with the recognition of the dominant unity of the universe. This unity was more than simply a finite aggregate of things, for it is the ultimate reason for things.[3] Thus we see Whitehead and Leibniz sharing a common assumption that there is to be an element in their philosophy which is outside the realm of rational explanation which must be accepted for what it is as, a 'given'.

The basis of Whitehead's philosophy of organism is the actual entity. There is only one genus of the actual entity, thus, Whitehead's ideal of a one substance cosmology can be achieved.[4] It is not possible to go behind or beyond the actual entity for something 'more real' for there is nothing.[5] However , there are gradations of importance and diversity of function. Prolonged investigation of the nature of facts will ultimately lead to actual entities.[6] Whitehead's system is atomistic, but unlike the notion of an atom as conceived by a materialist, whose 'atom' is of 'stuff' or 'matter', Whitehead's 'atom'

1.(Parkinson, 1973. Introd. px.) 2.(Parkinson, 1973. Introd. pxiv.)
The degree to which Whitehead's scheme can be referred to as 'metaphysical' rather than 'theological' is discussed in Chapter 3 Section11)
3.(Parkinson, 1973. Introd. pxiv-xvi.) 4.PR p110, 5.PR p18, 6.PR p19.

is based on the notion of an organism that grows, develops and perishes. The philosophy of organism is devoted to explaining the relationship between actual entities:

> "This is a theory of monads: but it differs from Leibniz's in that his monads change. In the organic theory, they merely **become**. Each monadic creature is a mode of the process of 'feeling' the world, of housing the world in one unit of complex feeling, in every way determinate. Such a unit is an 'actual occasion'; it is the ultimate creature derivative from the creative process."[1]

According to MacDonald Ross the attempts of Leibniz to construct a fully deductive system led him to become mediator between protagonists in disputes. According to the Cartesians, matter was a continuous homogeneous quantity so that the existence of distinct objects requires an explanation. Atomists led by Gassendi, believed that matter consisted of discrete bits separated by empty space. What required explanation was the cohesion of objects. Leibniz agreed with neither, for Descartes could not explain the distinction between matter and the space it occupied, there was no such thing as empty space. The universe was simply a sea of extended homogeneous matter. Bodies were explained as groups of matter moving together. But this still left the problem of cohesion to be explained. In order to avoid the notion of atoms as held together because they were made of smaller atoms, atomists argued that the atom was indivisible. Cohesion thus becomes an 'ultimate', 'given', inexplicable property of nature, which amounts to the creation of a 'given' in order to save the doctrine. But if it is a puzzle as to how, for example, the moon holds together, then it is a puzzle as to how the atom itself holds together. Leibniz' interpretation was that both views were correct, for the material world is made of matter and it is also a continuum. But this still left the question as to whether points small enough to be a continuum can be envisaged, without resorting to mathematical concepts of points with no extension? Anything small enough to be conceived as the base of the continuum would be too small to be the building block of matter.2 Having dismissed Descartes' argument concerning matter and space as inadequate, through his failure to recognise that motion must be based in energy, Leibniz did adopt it but applied it to energy. His

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1.PR p80, 2.SMW p129.
This choice facing Leibniz reminds us of Whitehead's question as to whether nature would prefer an infinite regress or a smallest particle.

conclusion was that it is the energy at a point which constitutes the essence of matter. The world is made of point particles of energy permanently expressed in motion. Extension of matter is derivative from this fundamental assumption of 'point energy'.[1]

According to Leibniz, monads are the basic elements at the centre of the nature of things. There is no way in which the monad can perish, change or be changed as a result of external forces. Their origin and end make it clear that they came into being together in the creation of the finite temporal order and their existence will cease similarly, all together. They always remain the same. Apart from that they cannot perish. (Monads 1-5) According to Parkinson, their possible death would be in a state of almost total confusion, but this state could not last because nature would gradually unravel confusion. Rational substances preserve individuality and personality so that both soul and mind last perpetually from the very beginning of things.[2]

The essential collective feature of the different and variant descriptions of substance offered by Leibniz, all of which have to be understood in relation to each other, is that monads are capable of action although they never act upon each other. This is because monads are completely impervious to external forces acting as causal influences of outside agencies. That the monad is simple implies that it is without parts, extension or figure or diversity. Hence, substances cannot be reduced into parts for they have none. It is the complex internal state of the monad which changes, in relation to its own internal programme for change. Thus, changes do occur from within as internal development as a result of the reciprocal co-ordination, so that monads are the source of variations and part of a continuous series of change. It is because every monad is subject to continuous change that the fundamental process is able to distinguishing each individual monad for what it is. Leibniz then feels justified in describing it as a living thing for to him this is the distinguishing feature of the organic view of nature. Substances are complete in themselves for they contain within themselves all the possibilities which could be, hence, each monad represents the entire within itself. (Monad 10)

1.MacDonald Ross, Leibniz, Oxford University Press, Past Masters, 1984, pp78-84. This doctrine depends on the fact that the internal relations alone can bind the entity together. 2. (Parkinson, 1973, pxviii)

Whitehead detects a major problem in the failure of Leibniz to reject Cartesian Substance philosophy, in so far as nothing can enter into or depart from the monad. This precludes any concrete reality of internal relations. According to Whitehead this left Leibniz with a choice for his monad between, conceiving it as the final real entity as substances which involve qualities, or that each one is an organisation of activity in which different ingredients are fused into a single unity which would then be the one concrete reality. (monad) into a single unity. Although these two concepts are exclusive, Leibniz has attempted to combine them, and this he achieved by describing the monad as 'windowless'. (Monad 7) This limits the internal passion of the monad simply to mirroring the universe. Worst of all justification for this mirroring is derived from an arrangement instituted by the Deity of 'pre-established harmony':

> "This system thus presupposed an aggregate of independent entities. He did not discriminate the event, as the unit of experience, from the enduring organism as its stabilisation into importance, and from the cognitive organism as expressing an increased completeness of individualisation. Nor did he admit the many-termed relations, relating sense-data to various events in diverse ways. These many-termed relations are in fact the perspectives which Leibniz does admit, but only on the condition that they are purely qualities of the organising monads,"[1]

According to Whitehead, the first mistake was in not rejecting the notion of simple location as an essential concept in relation to space and time. Second Leibniz accepted the concept of individual single substances as essential for the basis of real entities. Thus the only road open to him was that which Berkeley took, which was to appeal to the Deity to solve the problem.[2] Later, Whitehead explained how Leibniz came to make this error of judgement. He had failed to recognise the true blurred nature of the terms 'universal' and 'particular'. According to Whitehead, Universals may be particular in the sense that they are what they are, separate and diverse from everything else, while every particular is universal in so far as it is described by universals but itself does not enter into the description of other particulars.[3] Not only did Leibniz fail to recognise the close relationship between these two notions, retaining the concept of the universal in relation to his monad, but he also merged the notion with the

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1. SMW p193/4,
2. SMW p194 The positive criticism of Whitehead was that Leibniz had introduced into philosophy of an alternative doctrine concerning the ultimate actual things, that in some sense they involved the procedure of organisation. Whitehead regarded this as a great achievement of German philosophy. 3.PR p48.

sensationalist doctrine of perception. If qualities such as 'redness' or 'shape' are to be regarded as universals the only choice in the construction of an epistemology, is either to classify everything according to a single experient, which is the absolute, as in the case of Spinoza, or, as in the case of Leibniz, to have an indefinite number of substances as universals. Thus, in order to provide the scheme with coherence the monads had to be conceived of as windowless. This in turn led to further difficulties of explanation which were then overcome through the doctrine of pre-established harmony.[1]

The difference between Whitehead and Leibniz on this matter is considerable, for according to Whitehead, there is no possibility of adequately describing the actual entity in terms of universals because other actual entities enter into the description of any single actual entity.[2] Included within the Leibnizian monadology is a mysterious reality which is intrinsically unknowable by the use of any direct means. Each experiencing subject interprets its world on the basis of a complex of communications between ultimate realities: "This Leibnizian doctrine of law by pre-established harmony is an extreme example of the doctrine of imposition, capable in some ways of being mitigated by the notion of the immanence of God."[3] Whitehead believes that Leibniz's doctrine of windowless monads taints experience with a degree of illusion, which he attempts to overcome with a 'pious dependence upon God'.[4]

These comments by Whitehead illustrate the major difference between the two philosophies concerning 'change'. This becomes our third element for comparison. Whitehead described his own scheme as that of a theory of monads, the difference between his monad and that of Leibniz being that his entities simply become, the 'monad' changes.[5] The actual entity is a prehensive unification of an atomic cell of activity, in the process of its own becoming. Whitehead described this as taking place in phases, though it is impossible to separate one phases from another, for each depends upon the other and is an integral part of it.[6] Nor is the genetic process a temporal succession: "Each phase in the genetic process presupposes the entire quantum, and so does each feeling in each phase. The subjective unity dominating the

1.PR p190, 2.PR p48, 3.AI p133/134, 4.PR p190, 5.PR p22, 6.PR p220

process forbids the division of the extensive quantum which originates with the primary phase of the subjective aim."[1] Thus, the unity of the actual entity is preserved. The process of concrescence involves the inclusion of the formative elements, eternal objects, God and creativity, as an interfusion of parts into a whole. Within the process is the activity of the creative urge[2] in the form of appetition, and the lure of God through the subjective aim.[3] The operation of these two together which introduce the notion of novelty or newness.[4]

Although Leibniz taught that the monad is without parts, (monad 1) 'partless' is not intended to mean that the monad has no features or properties of its own, for in the monadology the term applies to a spatial and not to qualitative characteristics. Herein enters a major difference between the two philosophies on account of the retention by Leibniz of the 17th Century notion of substance, based on the doctrine of materialism. Leibniz emphasises the doctrine of change as an internal, continuing process, as change by degree. (Monad 13) The result is a plurality of properties and relations within the simple substance in spite of the lack of parts. Changing by parts in the monad can be accounted for by differentiating between qualitative and quantitative changes.(Monad 6) Thus, Leibniz does not deny the relationships between monads, for relationships are based upon mutual internal refinements of components. This continual process of adjustment is the basis of agency, and substitutes for the complete lack of response to external forces of change as a result of the windowless nature of the Monad.[5] This is what Whitehead refers to as the 'windowless' monad where 'windowless' means that nothing can enter into them or depart from them. (monad 7)

Each individual substance expresses the universe in its own way and in each a manner that its changes and states correspond perfectly with those of other substances, according to the pre-established harmony. The intimate union of body and soul is the supreme example of the perfect agreement ordained by God. Leibniz described the present state of a simple substance as 'a natural consequence of its preceding state',

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1.PR p283, 2.PR p21, 3.PR p244, 4.PR p88
The unity of the actual entity as the fundamental unit of recurrence in nature upon which all exists has been questioned as a consequence of Whitehead's description of concrescence. This is considered in Section 10.
5.Nicholas Rescher, G W Leibniz's Monadology, Routledge, London, 1991, p68.

such that: "...the present is pregnant with the future'. (Monad 22) It implies that the internal 'programming' of each simple substance is such that its entire history will unfold continuously according to an inherent principle. There is an inevitability about this development in the Leibnizian portrayal of the world: "Since all monadic change results from the programmed exfoliation of an 'internal principle' the entire history of each substance is fully predetermined, wholly contained in its complete individual concept."[1]

Rescher suggests that this deterministic aspect of the philosophy is mitigated by the freedom of the monad to unfold, reflecting its environment in a type of freedom within determinism.[2] It is as a result of the internal nature of change in the monad, that we are led to both the doctrine of the relationship between monads and the mutual internal refinement of substances. This goes some way in compensating for the windowless nature of the monad. Rescher's description of the activity of the monad as, 'freedom within determinism' raises the major question of the conflict between efficient and final causality. MacDonald Ross describes Leibniz' attempt to find a compromise between philosophers who reject all aspects of a final cause in nature and those who make it central. This: "...consisted in revamping the traditional view that all events have **both** efficient **and** final causes. In terms of his philosophy, they have efficient causes when considered as events in the material world, and final causes when considered as changes in the perceptions as monads.[3] The internal activity of the monad is directed towards its end or finality so that any one of its states is a contribution to the final perfection of the whole. The two notions of causation appear to merge in the completion of a single end.[4] Leibniz resolution of this apparent incompatibility was to appeal to a pre-established harmony. Only those monads were created by God which contributed to or could harmonise with the best possible world.[5] The proximity of the monad to the phenomenal world of efficient causation is illustrated by the fact that the monad is part of that world, hence the close relationship of efficient and final causation

1.Nicholas Rescher, G W Leibniz's Monadology, Routledge, London, 1991, p98.
2.Nicholas Rescher, G W Leibniz's Monadology, Routledge, London, 1991, p81.
3. MacDonald Ross, Leibniz, Oxford University Press, Past Masters, 1984, p96,
4. MacDonald Ross, Leibniz, Oxford University Press, Past Masters, 1984, p97,
5. MacDonald Ross, Leibniz, Oxford University Press, Past Masters, 1984, p98.

in the monadology, while both aspects of causation are preserved as operationally independent. In this way Leibniz preserves the monad as an active purposeful perceiver and a passive constituent of the world, both aspects being described in terms of perception.

To achieve this apparent compatibility Leibniz has resorted to the terminology of Descartes in his description of 'distinct' ideas as active powerful and spiritual, and 'confused' ideas in his description of perceptions as mechanically determined and material. Ross describes this as highly metaphorical language. Ross interprets Leibniz as meaning that although both causes continue operating, the final cause is dominant when a change of state results from a previous state of the monad's own situation, while efficient causality is dominant when a change of state ensues from changes in states from surrounding bodies.[1] This interpretation is derived from the Leibnizian statement that activity and passivity are mutual among created things. (Monads 49-52)

Leibniz believed that he had formulated a sufficiently strong 'a priori' argument to justify this doctrine of change.[2] First God had created the soul and every other real unity such that everything in the soul erupts from within the soul, in perfect spontaneity, yet in perfect conformity with things outside.[3] However, Rescher described this as an uncertain attitude of Leibniz towards substance. Since monads are a mirror of the universe, they will continue as long as the universe. The supreme substance must contain all reality possible and cannot be capable of limits. (Monad 40) It is in this application of the principle of sufficient reason to factual and contingent truth, which is used to justify our acceptance of the created order. Leibniz is suggesting that sufficient reason for these truths can only be found outside the truths of fact themselves, even though justification for their acceptance as fact, may lead to an infinite series of justifications. Other reasons offered for individual differentiated truths and justifications relate to contingent things. It is this which leads Leibniz to conclude that the ultimate answer is something which lies outside the series and this is a necessary being which we may call God.[4]

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1. MacDonald Ross, Leibniz, Oxford University Press, Past Masters, 1984,p99/100.
2.(Parkinson, 1973, p80), 3.(Parkinson 1973, p122/124), or (Parkinson 1973,p177)
4.Nicholas Rescher, G W Leibniz's Monadology, Routledge, London, 1991, p68.

A fourth doctrine of importance for comparison between the two philosophies is that of the 'principle of relativity'. According to the first Category of Explanation: The actual world is a process, and that the process is the becoming of actual entities. The actual entities are creatures;...".[1] This is reflected in the potentiality on one actual entity being a potentiality in the concrescence of many other actual entities: "... every item in its universe is involved in each concrescence. In other words it belongs to the nature of a 'being' that it is the potential for every 'becoming'. This is the principle of relativity."[2] Thus, the very notion of the actual entity in the philosophy of organism means an element in the totality of the process of becoming.[3] The principle of relativity means that an actual entity is present in other actual entities and it is a duty of the philosophy of organism to declare this notion.[4] It is the function of one actual entity to enter into the 'self creation' of other actual entities.[5] It is through one of the roles of eternal object that this relativity is accomplished.[6]

Whitehead's description of the actual entity 'feeling the universe' has its parallel in the Libnizian scheme with the monad 'experiencing the entire universe', hence, we find the two philosophies sharing a similar principle. However, whereas in the philosophy of organism the principle is simply part of the metaphysical structure of the scheme that dictates the relationship aggregates in concrescence, according to Leibniz it is through the distribution of God's bounty that all monads are obliged to harmonise with one another.[7] Hence, the notion of substance itself contains within it everything that can and does happen to the monad. Whitehead finds this to be a major difficulty with the Leibnizian monadology, for it has failed to provide an intelligible description of the interconnected relations of this world which we ourselves perceive and experience. On this basis, constructing an account of a set of abstract characteristics in order to explain a set of real particular things has proved to be inadequate.[8] The Leibnizian account regards each thing conceived, as complete in itself without the need of any reference to any other thing. Hence Whitehead's condemnation of the account of the windowless monads in which: "The universe is shivered into a multitude of disconnected substantial things, each thing in its own way exemplifying its private

1.PR p22, 2.PR p22, 3.PR p28, 4.PR p50, 5.PR p25, 6.PR p50,
7. (Discourse on Metaphysics, Parkinson,1973, p41)
8.Nicholas Rescher, G W Leibniz's Monadology, Routledge, London, 1991, p68.

bundle of abstract characters which have found a home in its substantial individuality."[1]

Leibniz formulated his doctrine concerning the interconnectedness of things, (Monads 37 and 38) by supposing a plenum of monads which are without differing qualities. (Monad 8) Thus, it is necessary for the sake of recognition that monads are all different substances, though God is the unique sufficient reason which unites the different qualities into a whole. (Monad 39) The result is that two sorts of universal interconnectedness in the Monadic system are discerned. The first is through the interconnections of the plenum, which is constituted by the monads in the relations each individual monad has with other substances, (Monad 8) i.e. there is a constant relational law by which reference can be made between one another.[2] The second, is the interconnection supplied by God in the universal connectedness of the harmony by which the windowless monads are united in the totality of creation. (Monad 39) According to Leibniz, the first represents what is a logically necessary feature of every possible world. The qualities of each monad represent the inner reflections of the outer conditioning which unfolds over a period of time: "...the qualitative complexity of monads lies in the circumstance that each of them provides a representation of the entire universe...".[3] The second is a contingent feature which is the best possible for this universe and is what demands the existence of God by providing the sufficient reason for the co-ordination of the endless qualitative variations possible.[4]

Leibniz had concluded that the necessary substance in which the changes which do occur, manifest themselves as differentiation **within** the substance and not as changes in the nature **of** the substance. God is the being that must contain within itself the total possible reality as a complete unity in perfection and also be the explanation of everything else which exists. God is a necessary being, according to Leibniz, because of both the a-priori (cosmological) and a posteriori (ontological) arguments. Thus, God is the primary single substance and the first unity, which includes the necessary eternal truths. (Monad 45) Consequently, Leibniz can demonstrate that eternal truths are not arbitrary but an internal part of the nature of the deity. It is from this deity that

1.AI p132/3, 2.(Parkinson, 1973, p177)
3.Nicholas Rescher, G W Leibniz's Monadology, Routledge, London, 1991, p62.
4.Nicholas Rescher, G W Leibniz's Monadology, Routledge, London, 1991, p140.

all monads spring, at a rate which is governed by the capacity of the created beings to receive them, for they are limited. Although Leibniz regarded God as 'extra temporal' and an exception to the process, being outside the description of the monad as a necessary substance, God can still be regarded as a monad.[1]

This draws attention to the fact that there is an important role for the Deity in both philosophies but these roles are not identical. In the philosophy of organism, God is the first actual entity, for through the application of the ontological principle the potential of the universe must be somewhere: "This somewhere is in the non-temporal actual entity."[2] As there is no going behind actual entities, God must be an actual entity.[3] This is made possible, even though there is only one genus of actual entity, by the introduction of gradations of importance and diversities of function between actual entities.[4] Thus God is not generically different from other actual entities, being different only in the primordial nature.[5]

In the philosophy of organism God has a threefold character, a primordial, a consequent and a 'superjective' nature. It is the primordial nature which is concerned with the concrescence of unities of conceptual feelings. Included among the data of which are eternal objects.[6] Whitehead's explanation as to why all things that could exist do not exist, is through his doctrine of the rejection of incompatibilities. The role to determine which of the pure potentiality of eternal objects would be involved in forming the data in the conceptual re-iteration of the actual entity was placed under the guidance of God as the principle of limitation.[7] This involved the 'lure' of particular 'feelings' into the concrescence, 'positive prehensions', and the rejection of others not compatible to the subjective aim, or 'negative prehensions'. These were not taken up into the concrescence. Thus, 'relevance' is determined by the subjective aim through contrasts, which in each case are determined by the drive for intensity of feeling which can best express the ultimate creative purpose. This ensures that each unification achieves the maximum depth of intensity of feeling possible.[8] In so far as the consequent nature is the superjective nature of God, there is in Whitehead's philosophy a two way dependence not present in the Leibnizian scheme.

1.(Correspondence with Arnauld, Parkinson, 1973, p68) 2.PR p46, 3.PR p18, 4.PR p19, 5.PR p110, 6.PR p88, 7.PR p164, 8.PR p83.

The Whiteheadian scheme includes a principle of unrest, described as appetition. This is a combination of the valuation of an immediate physical feeling and an urge towards the realisation of the datum as conceptually prehended.[1] It is a characteristic of the primordial nature of God, in God's 'unfettered valuation' through the role of eternal objects in concrescence.[2] It is the adjustment of the basic togetherness on which the creative order and therefore concrescence depends.[3] Hence, the graduated order of the actual entity is part of the primordial nature of God through which every prehension prehends, for it is a lure of feeling to which the actual entity aims in its concrescence i.e. the subjective aim influences the subjective form in order to enhance the intensity of feeling.[4] Through the word 'appetite' Whitehead is referring to his doctrine of God as the source of the subjective aim.[5] God's appetite represents the purposes of God in the world and it is this which influences what and actual entity can become. It shapes the nature of its becoming.[6]

According to Whitehead the Leibnizian God is deemed to be extra-temporal and an exception to the process of change, being outside the description of the 'created monad'. However, as the necessary being or substance, God can still be regarded as a monad. For Whitehead, Leibniz had a choice between two possibilities, either he could base his philosophy on one universal experient subject or on a doctrine of many substances. He chose the latter with his doctrine of many windowless monads, but according to Whitehead either of these options would taint experience with a certain degree of illusoriness: "The Leibnizian solution can mitigate the illusoriness only by a recourse to a pious dependence upon God."[7] As in the case of Descartes, Leibniz invoked the Deity in order to alleviate his difficulties of epistemology, an objectionable device if a consistent rationality is desired. Further, to leave the achievement of knowledge to the goodness of God rather than allow it to depend upon the whole matrix of nature, can hardly be very just. Even God's knowledge has to be explained.[8]

Thus, Whitehead protests that the role of God has been used as a prop to ensure the coherence of the philosophical scheme. Leibniz reiterated his case that God is the reason why existence prevails over non- existence. He applies God's urge to exist to

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1.PR p32, 2.PR p247, 3.PR p32, 4.PR p207, 5.PR p32, 6.PR p342/3. 7.PR p190, 8.PR 95.

all possible things. The reason why all things that could exist do not exist is the result of incompatibilities.[1] Leibniz thus conceived of a series of things through which the majority of what can exist, will exist. This series alone determines what will exist and that will include the most perfect, for in truth, perfection is no more than quantity of reality.

These observations, concerning the use of God as a prop, the role of God in the selection and limitation of the potentiality of creativity, as well as the earlier comments on Whitehead's assessment of The Leibnizian doctrine of 'pre-established harmony', collectively demonstrate the general dissatisfaction of Whitehead with the role ascribed to God in the Leibnizian scheme. Furthermore, a summation of the evidence provides a picture of the absolute centrality and pivotal role of God within the doctrines of the monadology.

The basis of our sixth area of comparison is the way in which, in the philosophy of organism, the actual entity participates in a systematic scheme of relatedness, providing a dominant order through which the actual entity can be felt as a community. It does this through nexus and societies. A nexus with social order is a society.[2] A society is an environment of order for its members, the endurance of which is a product of the genetic relations between its members.[3] No society is a society alone for each is part of a system of societies with some characteristic in common. Through the process of 'transmutation' structured societies of a lower order may produce material bodies such as rocks and crystals.[4] Societies of a higher order, through the dominance of the mental pole of the actual entities, may produce societies of living organisms which display 'life' in varying degrees.[5] From this Whitehead developed a doctrine of 'psychological physiology' which dispensed with the Cartesian inspired 'mind/body' problem, which he described as a fudge.[6] The vith Category of Obligation is that of 'transmutation' which describes the means by which the microscopic, in becoming the temporal and macroscopic, can pass into that realm, the feeling and data required in its own creativity. Whitehead described the process as the need: "...to account for the

1. (Leibniz, A Review of Metaphysics, Parkinson, 1973 p145)
2. PR p34, 3. PR p90, 4. PR p101, 5. PR p102, 6.PR p47.

substitution of one nexus in place of its component actual entities.", [1] and Leibniz' attempt to do so as: "...an unanalysed doctrine of confusion."[2] The doctrine of 'pre-established harmony he described as a fudge. These doctrines are closely linked to that of 'perception' and observations on that doctrine must now be discussed.

Leibniz had introduced the notion of appetite and appetition in connection with his description of 'souls', everything about which had to be explained in terms of perception and appetite. He envisaged a 'beautiful harmony' of vitality and mechanism in such composite bodies.[3] It is not until monad 61 that Leibniz fully considers the question of the unification of composites or aggregates, though in monad 18 he has introduced the concept of the 'entelechy'. This, he explains, is simply the co-ordinated functioning of what are essentially independent simples. Compounds or bodies are pluralities of simple substances which are lives, souls or minds, thus, life is everywhere in the universe. Though monads are partless they constitute the principle of change because simplicity allows for multiplicity through modifications which do exist in the same substance. These changes consist of the varieties of relations of the simple substance with things external to it.[4]

Leibniz described a substance as being either simple, such as a soul with no parts, or composite, such as an animal, which is a soul plus an organic body. A body may be described as a combination of simple substances or 'monads':

> "But an organic body, like every other body, is merely an aggregate of animals or other things which are living and therefore organic, or finally of small objects or masses; but these also are finally resolved into living things, from which it is evident that all bodies are finally resolved into living things, and that what, in the analysis of substances, exist ultimately are living substances - namely, souls, or if you prefer a more general term, monads, which are without parts."[5]

Every simple substance or monad has an organic body corresponding to it. This it is, which provides the orderly relations to other things in the universe which we observe and it is this which acts upon others and is acted upon by them.[6] Leibniz contrasts this

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1.PR p27, 2. PR 251, 3. (Parkinson, 1973, p173)
4. (Parkinson, 1973, p195) 5. (Parkinson 1973, p175)
6. Nicholas Rescher, G. W. Leibniz's Monadolgy, An Edition for Students, Routledge, London, 1991, p46.

representative characteristic, which the monad has of the whole universe, with the fact that it represents the body which is bound to it. This introduces the 'entelechy' which we are informed is always organic. The order of the monad is passed onto the order of the body which is then also able to express the whole universe through the plenum and the soul does the same in its role as representative of the body.(Monad 62) Rescher explains that having a body as 'expressly bound to it' means that monads are able to form groups of organised complexes such that they acquire bodies by way of association. These bodies are of certain other substances which are in harmony with it and for which it serves as a unifying 'entelechy'.[1]

The monad to which the body belongs is for that body its entelechy, which together constitute an organism. The addition of the soul to the entelechy forms an animal, hence the body of an animal is always organic. (Monad 63) Rescher describes the initial formation of monad and body, the entelechy, as a 'quasi unity' which becomes the basis of a three level hierarchy of organic existence of these aggregated substances. The first level is that of mere organism which is the entelechy, monad / body. The term describes the created monad in general.[2] The second level is the mere animal which is an organism with a dominant soul where the soul rules the animal: "I hold that the generic name of 'monads' or 'entelechies' suffices for simple substances which have nothing but this (viz. mere perception), and that one should call 'souls' only those whose perception is more distinct and accompanied by memory."[3]Monad 19 The third level is that of the intelligent creature where the animal is dominated by spirit. (Monad 63) Only spirits have apperception or self-consciousness. We are reminded that although Leibniz does discuss the created order as at three levels we must remember each is truly a part of the totality of the universal order of co-ordination:

> "Organisms have (bare) perceptions; animals have consciousness or feeling; intelligent creatures have self-consciousness. Since all monads have an environing 'body' (entourage) of some sort, Leibniz's philosophy is pan organic. And everyone of these organisms is, in its own characteristic (and imperfect) way, a living mirror of the whole universe."[4]

1. (Nicholas Rescher, London, 1991, p59).
2. Nicholas Rescher, G. W. Leibniz's Monadolgy, An Edition for Students, Routledge, London, 1991, p78.
3. Nicholas Rescher, G. W. Leibniz's Monadolgy, An Edition for Students, Routledge, London, 1991, p91.

The 'pan-organic' outlook is strongly re-enforced by Leibniz in his description of everything as a part of the machinery of nature. (Monad 64) The organic nature of the machine is inherent in the hierarchy where each organic body, as a living machine, is a kind of divine machine. This is superior to a humanly created machine for it is a machine in all its smallest parts ad infinitum. Leibniz finds evidence of the divine plan in the purpose demonstrated in the organisation of the parts of the organism which functions as a whole, typifying the unity of the whole of nature.[1]

Rescher, focuses attention on the Leibnizian notion that all nature may be described as being 'alive' and that no created monad is without a body, making the monad a vital centre of an organic structure.[2] However, it is not true to say that: "...every composite body has a single dominant monad that makes it into a quasi unit. In nature there are 'mere aggregates.'"[3] The implication is that we should contrast this observation with the role of conceptual prehensions and the subjective form in the Whiteheadian scheme in which clearly a dominant feeling does develop which directs the progress of the concrescence.

According to Rescher the divine plan inherent in the Leibnizian monadology represents the great 'organism maker' not the great 'machine maker' of Copernicus and Newton, for it is clear that Leibniz regarded the organism as the 'quintessential machine' which runs organically as a living machine with its own inherent teleology and purposiveness. This analysis stemmed from the Leibnizian view of nature as an integrated hierarchy of function of great complexity which was founded upon metaphysics. As a result of the inter-relatedness of things, knowledge of nature must be transposed through the development of the whole co-ordinated scheme.[4]

In his doctrine of perception, Whitehead wished to avoid the exact meanings associated with 'representative' perception. As a result, in the case of presentational immediacy, he adopted the word 'apprehension' to represent a 'thorough

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4. Nicholas Rescher, G. W. Leibniz's Monadolgy, An Edition for Students, Routledge, London, 1991, p220.

1. Nicholas Rescher, G. W. Leibniz's Monadolgy, An Edition for Students, Routledge, London, 1991, p220.

2. (Rescher, 1991, p220) 3. (Rescher, 1991, p225) 4. (Rescher, 1991, p80.)

understanding', and the new word 'prehension', or prehensive unification, for the general or lower way in which things represented each other. The word prehension is used where there is a desire to avoid conscious or representative perception.[1] In the philosophy of organism, 'appetition' is applied to two aspects of concrescence. As well as being the valuation of an immediate physical feeling combined with the urge or drive towards the realisation of the datum which has been conceptually prehended,[2] it has a second role in connection with the primordial nature in god's unhampered valuation of the infinite realm of eternal objects.[3] Prehended in every actual entity is: "The graduated order of appetition constituting the primordial nature of God."[4] Whitehead's explanation of appetition is as the means by which God's purposes through lure are achieved through God's role as promoting the intensity of feeling.[5] Whitehead believed that the two words chosen by Leibniz to represent the different modes of perception, the cognitive and the uncognitive, both tended to convey the 'representative' interpretation of perception. However, Whitehead's chosen words are equivalent to those chosen by Leibniz, to make the required distinction between modes of perception clear.

According to Leibniz, perceptions are driven from one to another by 'appetition'. The Leibnizian doctrine of 'appetition' is just one part of his rationalistic philosophy of nature, where rationalism means the reduction of knowledge derived from sense experience to a lesser status than that provided by reason.[6] The other part is perception. According to Leibniz, perception constitutes the internal condition of the monad through which it represents its own environment of the world. Even though the perception may fail to attain total completion some aspect of it always does achieve completion and it is this which leads on to other perceptions. (Monad 15) Appetition, is the name given to the action which brings about the changes which constitute the passage from perception to perception. Thus, appetition is the internally programmed drive or tendency from one family of perceptions to another. It is the drive or urge through self-development to bring new features into actuality.[7]

1.POR p236, 2.PR p31, 3.PR p247, 4. PR 207,
5.Nicholas Rescher, G W Leibniz's Monadology, Routledge, London, 1991, p101.
6.Nicholas Rescher, G W Leibniz's Monadology, Routledge, London, 1991, p81.
7.Nicholas Rescher, G W Leibniz's Monadology, Routledge, London, 1991, p78.

According to the 'monadology' the entire history of the monad's changes of state, which are changes or perception, has been programmed into the nature of the individual monad and represents an internal principle of change. It is this law which governs their unfolding or exfoliation. The free actions of the monad unfold within them. This is a freedom within determinism. The drive or urge represented by appetition is the basis of all change and novelty. Monadic activity is in fact the transition of one set of perceptions to another. Monadic activity is the defining characteristic of any substance, the terms 'substance' and 'agent' for Leibniz being almost synonymous.[1]

The ability of the monad or entelechy to perceive, or in the case of souls to apperceive, is in effect the nature of change in the internal process within the monad. The notion receives clarification through his development of the concept of perception. The word perception is used to describe: "The transitory state which enfolds and represents a multiplicity in a unity, or in the simple substance, is exactly what one calls perception." (Monad 14). Perception is not confined to a special type of being which has consciousness but it relates to nature in its entirety. Leibniz makes clear in Monad 24 the consequence of this universal aspect of perception, for it is from this perception that the 'tones' and 'colours' of heightened and enhanced experience, can be developed. Whithout such development we would simply remain in the state of unconsciousness.[2] This description is analogous to that of Leibniz and the enhancement of tone of colour to perception, by which the special cases of consciousness may be achieved.

The consciousness of animals and the self-consciousness of humans are special cases. Leibniz strongly opposed the view that all mental life was conscious. This is in contrast with Descartes and Cartesians who placed humans on a pedestal in suggesting that only they perceived and that the remainder of the world of living organisms, of plants and animals were all alike 'sub-human' and regarded simply as physical mechanisms.[3] Leibniz distinguished 'perception' from 'appetition' and 'consciousness', where perception is a broad concept, concerned with a multiplicity in

1.(Rescher, 1991, p81), 2. (Rescher, 1991, p75), 3.(Rescher, 1991, p101)

the confinement of the unity of a single substance. Thus both Whitehead and Leibniz attribute the important characteristic of perception, to more primitive organic and inorganic material than the Cartesian materialists.

Leibniz challenges Locke's thesis that there are no innate ideas, suggesting that reflection is in fact no more than the paying of attention to what is already within us. There are such things as unities, substance, duration and change, as well as intellectual objects of which we are unaware but which are always with us. Thus, these are innate in us. Leibniz moves from this awareness of ourselves to our awareness of our surroundings, making a distinction between what we consciously perceive and that unconsciously perceived, for:

> "there are at all times an infinite number of **perceptions** in us, though without **apperception** and without reflexion; that is to say changes in the soul itself which do not apperceive because their impressions are either too small and too numerous, or too unified, so that they have nothing sufficiently distinctive in themselves, though in combination with others they do not fail to have their effect and to make themselves felt, at least confusedly in the mass."[1]

The difference between perception and apperception can be recognised through our familiarity with things, as for example whether a windmill was working or not on the latest sighting, or the capacity of water in a waterfall. Though the motion continues, our familiarity to it dulls the senses and we fail to take cognisance of it. Attention requires some degree of memory but we allow some perceptions to pass without reflection, or even noticing them at all. They become devoid of the attraction of novelty: "Thus there were perceptions that we did not immediately apperceive,..."[2] Leibniz introduces a fresh analogy, of the rope that breaks under strain on account of the weakening of the lesser strains that were put upon it, but which had no apparent effect at the time of the initial exertion. Leibniz describes these small or minute perceptions of which we are not conscious, as being more 'efficacious' in their consequences than we might ever have suspected.[3]

According to Leibniz these important perceptions are the tastes , the images of

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1.(Parkinson, 1973, p155) 2.(Parkinson, 1973, p155) 3.(Parkinson, 1973, p156)

qualities of our senses, the impressions the bodies surrounding us have upon us, which includes the infinite, which is the link between ourselves and the rest of the universe. We could describe them as making the 'present big with the future and laden with the past'.[1] They inform us that all things in the universe are in concert, and God knows them all. These same insensible perceptions are indications and constituents of personal identity. The continuity of the person lies in the connection between past and present states. The link through a duration is provided by the residual effect of previous states which are preserved by these minute perceptions connecting them. This occurs regardless of whether the individual is, or is not conscious of it happening, in so far as the individual may not recollect them. However, they do provide the means of recollection for memory.[2]

Latta believes that the choice of words by Leibniz may have been unfortunate. For example he has used the word 'perception' in a way different from that of other philosophers and thereby brought unnecessary confusion into his philosophy. According to Latta, Leibniz is insisting that the part must represent the whole, just as a symbol may represent the totality of something, and also that the whole must be able to come from the part, even if in practice it may never be called upon to produce the whole, acting spontaneously from within itself. It is this representation that Leibniz refers to as 'perception', which is one part of the force from which the monad is created, (Leibniz prefers this title rather than 'quality') the other part of the force being 'appetition'. This represents the act of the whole coming from the part, both perception and appetition being required. A monad is thus the new unit of simple substance which comes from a combination of these two which Leibniz refers to as a 'metaphysical atom'.[3]

Leibniz uses a notion of confused perception in order to explain the pre-established harmony between soul and body and of all monads. He describes the roar of the waves on the sea-shore as being a combination of minute perceptions which cannot be distinguished in a crowd, the roar being the result of the combination of all the waves together.[4] The resulting world can give satisfaction to the intelligent being, but, in so

1. (Parkinson, 1973, p156) 2.(Parkinson, 1973, p156)
3.Robert Latta, Leibniz, The Monadology, OUP, 1951, p48.

far as monads are minds, displeasure may arise as a result of our own inability to understand distinctly. Leibniz attributes this deficiency in perception to ourselves and it is that which prevents us from perceiving the harmony.[1] It does mean that a soul will by necessity, receives many confused perceptions which are the aggregate of many external things, making the mind both a mirror of the universe and also a substance in the image of God.[2] They also determine our response to our many experiences to which we have no conscious reaction. They are the cause of our background feelings of unease or pleasure in particular circumstances. It is these which prevent our perceptions of colour, heat and other sensible qualities as being interpreted as arbitrary, as occurs in the Cartesian system, as though God could delight in allowing humans to be deceived. In Leibnizian philosophy they totally replace the previous doctrine of Descartes in which the two substances of mind and body are separate, one from the other.[3] Evidence for the justification of such a doctrine is based upon the nature of our actions in conjunction with memory. In terms of a sensationalist theory, they are the impression of our soul to its surroundings, hence they are the link with the remainder of the universe and therefore with the infinite. They provide the connection and thereby the continuity of time and space. They are also part of our personal identity which links every individual soul into the totality of the universe. They provide an alternative explanation to that of the sensationalist theory of perception of knowledge of the natural world.[4]

Whitehead reflects a similar doctrine when he states that: "In general, consciousness is negligible, and even the approach to it in vivid propositional feelings has failed to attain importance. Blind physical purposes reign."[5] According to Whitehead, the application of the theory of 'confused perception' is an attempt by Leibniz to deal with the perplexity inherent in all monadic cosmologies, namely that of relating the metaphysical necessity to the contingent temporal order of which our experience is a part. The failure of Leibniz is in not explaining from where the doctrine of confused perception originated in the first place and then offering a solution to the difficulty

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4. (Parkinson, 1973, p156)
1. (Parkinson, 1973, p147) 2. (Parkinson, 1973, p177) 3. (Parkinson, 1973, p157)
4.Nicholas Rescher, G W Leibniz's Monadology, Routledge, London, 1991, p147.
5.PR p308,

with an unanalysed doctrine of confusion.[1] Monads constitute the things of this world, they do not simply enter into them. They are not 'objects' which can be empirically demonstrated as existing but are hypothetical entities the purpose of which is to provide an explanation for notions of fact within science, philosophy and theology. In this way the one single unit is made to account for the many substances of the world of our experience.[2] The quantitative changes of the material world are related to the qualitative changes of the metaphysical realm of the Monad. According to Rescher, the changes of the monad by degree, conform to the evidence provided by nature that demonstrates through its changes, some law of operation of continuity. This is part of the Leibnizian concept of the principle of perfection.[3]

The inability to describe satisfactorily the transition from the metaphysical Monad to the actual world of experience constitutes for Whitehead one of the major criticisms of the Leibnizian Monadolgy. His explanation of confused perception of the actual world has become the fault of the perceiver of god's world of harmony. Confusion arises as a result of an inability to disentangle the infinite number of perceptions, does not provide for a category such as that of Transmutation through which some description can be made of the means by which the actual entity can become the actual world.[4] In the philosophy of organism this notion is substituted by that of the qualification of physical substance by quality. In transmutation there is the opportunity for the combination of simple physical feelings with complex derivative feelings. In this way the philosophy of organism, as an atomic theory, can avoid the difficulty unanswered in the monadology of Leibniz.[5] The foundation of Whitehead's theory is the fundamental concept of the prehensive unification of volume, which is in reality an indefinite number of sub-volumes or an ordered aggregate of contained parts.[6] In order to describe its nature, Whitehead resorts to the language of Leibniz when he says that every volume mirrors in itself every other volume in space.[7] This 'mirroring' is also an essential notion in the Leibnizian scheme as the monad mirrors within itself and its own nature, the rest of the universe. (Monad 14) In each of these cases the mirroring

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1.PR p251,
2.Nicholas Rescher, G W Leibniz's Monadology, Routledge, London, 1991, p46.
3.Nicholas Rescher, G W Leibniz's Monadology, Routledge, London, 1991, p74.
4.PR p251, 5.PR p27

reflects a certain pattern in creation which is an essential ingredient of nature. In the philosophy of organism each actual entity, by the inclusion in its concrescence, includes some aspect of other actual entities and their pattern.[1]

Latta suggests that Whitehead's response to what he regards as the inadequacies of the Leibnizian answer to this fundamental metaphysical question, is to replace the Leibniz doctrine of perception, (monads 9-14) which Whitehead describes as an un-thought through doctrine of confusion, with his own doctrine of feeling and transmutation. Leibniz has been content in his account to describe the way in which a simple substance is derived from its previous state, thereby leaving its present state full of potential for a future state. For Leibniz it is the condition of memory which differentiates the human condition and that of the higher animals from other things for only the former are regarded as having 'souls'. Even in the condition of a dreamless sleep the soul still does have some perception. (monad 21) though we may be stupified by the lack of distinguishing features in the many perceptions we do have. It is when we come out of our stupor that we are aware of the stupor and that we have been dreaming. This supports the doctrine that all perceptions come from other perceptions. (monad 24)[2]

Prof. Emmet believes that Whitehead and Leibniz agree that self consistent thought alone concerning the possible, can only provide for what is possible to become actuality, but a decision is required concerning these possibilities. The suggestion is that there must be existing in stubborn fact some aspect of givenness. It is exactly this

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6. The notion of a monad or group of monads as causally free from outside influences (monad 10) is an important concept which is reflected in Whitehead 's description of an 'Ideally Isolated System'. SMW p58 According to Whitehead, this is a concept which is essential to both science and knowledge in general. It is a form of separation from the remainder of the universe, in such a way that there are truths which only require reference to remaining things through a uniform scheme of relationships. This is not isolation in terms of substantial independence from other things, but rather causally free, and not having contingent dependence upon them. The system as a whole in all its concrescence is still dependent on the remainder of the universe. SMW p59 According to Rescher: "Monads are causally independent, but not totally independent because of such reciprocal co-ordination through alignment rather than influence." (Rescher, 1991, p59)

7.SMW 81,

1.SMW p130, 2. Robert Latta, Leibniz, The Monadology, OUP, 1951, p48.

givenness which is demanded by a search for sufficient reason for what is given is that which cannot be discovered by logical analysis.[1] There could not be a sufficient reason for simply any course of creation, hence the two are in agreement that the realm of the possible is wider than that of actuality. They also agree that there must be some form of primordial limitation on pure creativity. It is in relation to this question that Leibniz has introduced his doctrine of the best possible worlds. The answer of Whitehead is to refer to god as the principle of concretion and a particular course of events. The primordially created fact which is a limitation on pure creativity in the philosophy of organism resides in the nature of the actual entity, through the ontological principle.[2] Hence Whitehead's description of actual entities as atomic decisions among potentiality.

Whitehead could describe the Leibnizian doctrine of the 'best possible worlds', as an audacious fudge[3] because Whitehead constructed his metaphysical scheme on the basis of a world view first, from which he then found a place for the deity as it became necessary. Leibniz adopted a theistic position as a basis to explain the world. Whitehead's statement that critics of Plato's cosmology, as recorded in the Timaeus: 'are obsessed with the Semitic theory of a wholly transcendent God creating out of nothing an accidental universe'[4] points to the strength of feeling Whitehead had concerning the priority and order of things. Thus, apart from all the similarities of notion and structure which clearly exist between the two this difference concerning the role of the deity is so fundamental that the two schemes must be regarded as metaphysically distinct.

Further, even though in Whitehead's philosophy of organism the inclusion of a major role for the deity does not introduce the same deterministic element as that introduced into the Leibnizian scheme, we do have in both cases an appeal to a metaphysical necessity. The main difference between the two is that in one case the role is within the scheme and the other, it is without. The importance Whitehead attributes to this metaphysical necessity can be recognised in his comparison between Plato's Timaeus

1.(Dorothy Emmet, 1966, p197) 2. (Dorothy Emmet, 1966, p199)
3.PR p47, 4.PR p95.

and Newton's Scholium to his Principia, which Whitehead describes as having adopted the 'Semitic cosmology'. In this the deity is the transcendent creator who will terminate the universe on a whim but who fails to participate in the activity of the creation in any other way. In other words the superiority of the cosmology within the Timaeus is that it has an essential metaphysical dimension which recognises the participation of the eternal within the temporal.[1]

Summary

In this Section we compared the role of the monad in Whitehead's philosophy of organism with the 'monad' of Leibniz' of his 'Monadology'. A similarity between the two philosophical schemes was reflected in a common aim, to discover the 'primitive concepts' or 'basic principles' which are at the heart of nature. Whitehead described his monad as an 'actual entity', based on the notion of an organism which grows, develops and perishes, while the 'monad' of Leibniz cannot perish or be changed by external forces. The existence of the monad will continue as long as time lasts, for they came into existence with the creation of the universe and they will cease to exist only when the universe ends. The metaphysical concepts which underpinned the theoretical particle or monad of each philosophical scheme demonstrated radical divergence as well as some similarities. For example, the actual entity 'becomes', as the result of an interfusion between physical feelings of the actual world, and the formative elements of the eternal, the becoming developing under the urge towards intensification of feeling and novelty, the monad is without parts, has no features of its own and cannot be changed by external forces. However it does experience internal adjustment in response to the world. Though not affected by external forces the monad has a window open to God. Even so, Leibniz could describe the present state of any monad as a simple substance, as a natural consequence of its preceding state. This related to an unfolding of a predetermined history rather than some opportunity to develop new characteristics. Both philosophers referred to the 'interconnectdness' of things, Whitehead's doctrine of 'relativity' describing the way in which the actual entity 'feels' the universe, with the proximate universe participating in the concrescence of the actual entity. Leibniz accounted for the physical universe through

1.PR p93-95.

the notion of the plenum. The influence of proximate monads one to the other, was demonstrated through the internal adjustments of quality, which was the only manifestation of change they experienced. This took the form of an exfoliation of the individual character of each individual simple substance. The role of the Deity was of great importance in both philosophical schemes. God was involved in the concrescence of the actual entity through the subjective form, the nature of which was governed by the subjective aim, as the genetic advance of the actual entity proceeded towards its satisfaction. In the ''Monadology' the fundamental role of the monotheistic Deity, was utilised as a prop for the given natural order which was created and set in motion by God. This was expressed in the Leibnizian doctrine of 'pre-established harmony', a doctrine Whitehead rejected as unsatisfactory and unjustified. Both philosophers had to face the challenge of the development of pluralities based upon their respective monads on which their epistemology is founded. Within the Leibnizian monadology, pluralities may be formed by association of monads as bodies or compounds. The characteristic of the monad determines the character of the body which is bound to it, in the form of the organic entelechy. Both philosophies attempted to account for the concept of a metaphysical particle becoming the basis for the actual world of our experience. Whitehead accomplished this through his doctrine of transmutation nexus and societies of entities became the building blocks of the objects we perceive. Leibniz' account, through the activity of the 'windowless' monad Whitehead described as a 'fudge'. This Section concluded with the consideration of the similarities between the two philosophies concerning the doctrine of perception. Whitehead was found to have adopted the structure and concepts involved in the Leibnizian doctrine, both changing and adding to his language. He took up Leibniz's notion of the 'efficacy' confused perception and transposed it into the mode of 'causal efficacy'. Leibniz believed that through his doctrine of perception he had solved the mind/body problem bequeathed to us by Cartesian substance philosophy. This affirmation was also adopted by Whitehead.

10. Some Objections to Whitehead's Thesis

In this section we will consider some criticisms of Whitehead's philosophy of organism relating in particular to his doctrines of 'feeling', 'the actual entity', the 'formative elements' of 'eternal objects' 'God' and 'Creativity' and finally 'transmutation' and 'perception'.

1 Feeling

In the philosophy of organism it is probably the doctrine of positive prehension or 'feeling', more than any other, that has deterred philosophers from wholeheartedly embracing Whitehead's thesis, yet it is fundamentally important within the philosophy. The words 'positive prehension' and 'feeling' are used almost synonymously. The word 'feeling' is regarded by many philosophers as among a group of words in the philosophy of organism, the meaning of which has either been stretched or significantly altered from the normal usage. Thus, the first question which arises relates to the choice of the particular word 'feeling' to describe the role Whitehead has conceived for it. This was part of Prof. Emmet's concern when she expressed difficulty in understanding how a feeling can feel something which has already perished.[1] This problem is the result of the notion of the satisfaction of the genetic analysis of the actual entity becoming the basis of the morphological description, which is required in an understanding of the transmutation of the entity into the occasions of the actual world of our experience. According to Prof. Emmet, what is lacking in Whitehead's description is some explanation of the subjective aim at the macroscopic level.[2]

Another aspect of Whitehead's usage of this word relates to his combination of two, previously considered, radically different ideas under the umbrella of this one word. He has combined the conceptual feelings of emotions, which are derived from experience of the formal structure of the world and which constitute a state of mind, with the concept of the transference of physical energy, in what is traditionally regarded as the physical processes of nature. Thus Whitehead's description of 'feeling' in concrescence includes both simple physical feelings and conceptual feelings, which represent two

1. (Dorothy Emmet, 1966, p77) 2. (Dorothy Emmet, 1966, p78)

very different aspects of the character of our world. The former, the physical, is generally associated with the inanimate and the latter, the conceptual, with the organic and mind. In short, the difficulties appear to stem from the fusing of conscious feeling and unconscious physical activity under the one heading of 'feeling'.

According to Wolf Mays, the different possible interpretations of Whitehead's terminology add a further complication. Conceptual feeling is normally used to convey the notion of some form of logical structure, whereas physical feeling means the transference of physical energy within nature.[1] However, if these feelings are analysed more deeply into more specialised details, for example propositional feelings of either imagination, memory or dreams on the one hand, and perception which includes authentic (conscious) inauthentic (delusiary and hallucinatory) on the other, we may be led into confusing psychological states, when processes of the physical world were intended. Mays believes that many interpreters of Whitehead have been led into this fallacious position.[2]

Whitehead did anticipate that some difficulties would arise from his linking of the physical explanation of the process of nature with that of the feeling of value in mental and spiritual consciousness, and even that of life itself, in a common origin. His discussion on the different attitudes taken by Realists and Idealists concerning the mind / body problem is an example,[3] which in this case revealed an optimism that: "...we shall find a movement in science itself to reorganise its concepts, driven thereto by its own intrinsic concepts."[4] Whitehead made efforts to distinguish and separate his own doctrine from others such as mysticism and pan-psychism. For example, philosophies which include the notion of some greater reality standing behind nature have no part in his scheme.[5] Yet according to Wolf Mays, Whitehead's doctrine on 'feeling' even led Bertrand Russell to conclude that Whitehead was introducing a form of mystical pantheism into his philosophy.[6] However, according to Evander Bradley McGilvary, we should recognise that Whitehead did not take this is a route.[7]

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1. (Wolfe Mays, 1958, p53) 2. (Wolfe Mays, 1958, p146) 3.SMW p97ff, 4.SMW p109, 5. SMW p115,
6. (Wolfe Mays, 1958, p132) Clearly Theism and mystical pantheism are at different poles of the theistic spectrum but this only illustrates the breadth of the scope for misunderstanding. 7. (Schilpp, 1951, p226)

In our analysis of the actual entity we discovered that 'feeling' is at its very heart. There is nothing more than an aggregate of prehensions or feelings. This unquestioningly establishes the pivotal role of 'feeling' at the centre of the philosophy of organism, for the actual entity is the foundation of the world we experience. The actual entity is the operation through physical feelings, which account for the physical aspects of the time, space and endurance of the cosmos. For Whitehead, the order of creation is not concerned with independent objects simply located in time and space, but everything is part of one total unity which is the product of a continuous process of transmutation. Each transmuted entity has a bond or relationship with all other entities in the universe for that entity is a manifestation of prehensions.[1] This is the basis of Whitehead's theory of Relativity.[2]

Whitehead's doctrine that the elements of the physical world are the product of their emergence from their location in the distribution of the transmuted actual entities, is linked to location, and this brings him into conflict with the adopted general theory of relativity proposed by Einstein. This is of concern to Evander Bradley McGilvary, who recognised Whitehead's version of the theory of relativity as being at the heart of his philosophy of organism, for it is a product of the development of his theory of prehensions.[3] The consequence of this doctrine is that Whitehead insisted that any 'definiteness of character' is the result of relatedness and not the opposite, i.e. definiteness of character is through relatedness.[4] According to Whitehead, uniform relatedness must always come first, for this is the only way to commence a philosophy of nature. The other way round can only offer a: "...causal heterogeniety of these relations."[5] McGilvary recognised the possibility of conflict between that doctrine and the interpretation of the facts available from experiment which demonstrate contingent relations of nature, and conclusions from deductions of logical processes which are simply expressions of nature's uniform relations.[6]

First, it appeared to McGilvary rather disingenuous of Whitehead not to accept the postulates of Einstein that, for example, the speed of light would be considered as a

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1.PR p19/20, 2. (See Section Side) 3. (Schilpp, 1951, pp212)
4.P of R. pv - vi. 5. (Schilpp, 1951, p219) 6. (Schilpp, 1951, p215)

constant - which Eintstein laid down as principles or assumptions in his efforts to

establish the description of simultaneity at a distance - and then expect others to accept his own postulates of eternal objects and a deity which includes both a primordial and a consequent nature. Second, it is of major significance that Einstein's experiments raise the question of the relationship between space and time, these being at the core of Whitehead's doctrine of prehensive unification. However, there are reasons to suggest Whitehead's position may not have been absolutely consistent in his welcome of the notion of space-time and thereby it appears unclear.[1]

According to McGilvary, in insisting upon the dominance of his own doctrine over the results of Einstein's experiments, Whitehead was denying a fact of experience when he differentiated between a stone in space and a stone in time, insisting that the response is different in each case when considered in terms of physical unity. McGilvary considers the nature of the stone as a product of sedimentation for example, and that it can be crushed into powder. Failure to recognise these possibilities concerning the stone, in respect of the stone in time and space, is to adopt a form of Platonism. It also raises the question of whether both a stone and a colour have parts.[2] McGilvary questions whether, if our conclusion is that there is no such thing as a 'bare event', this really justifies the introduction of the notion of 'ingression' in order to reconstruct the entity which has in abstraction just been torn apart. Why not simply allow the entity to be the entity that it is, without parts, and not tear it apart in abstraction only to reconstruct it again The implication of this conflict, for McGilvary, is that the whole construction of Whitehead's organic philosophy is unnecessary. There is a more simple explanation for relativity available than the complexity which ensues from the philosophy of organisms based upon prehensions.

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1. P of R, p88 . Here Whitehead states: "My whole course of thought presupposes the magnificent stroke of genius by which Einstein and Minkowski assimilated time and space." This should be compared with Whitehead's strong case against such a merger, with the subsequent loss of the physical objectivity of each, and for the retention of space and time as separate physical entities. SMW p80/81.
McGilvary believes that it was reliance upon some mistaken mathematics of Minkowski that led Einstein into accepting 'space-time' thus depriving each of its own physical objectivity, rather than maintaining the distinction between the two. P224/5
2. (Schilpp, 1951, p228/9)

McGilvary relates Whitehead's theory of relativity to his doctrine of simple location. In the former there is a 'certain sense' in which everything is everywhere at all times, while in the latter, Whitehead's theory of objectification is an aspect of his theory of relativity, which involves his doctrines of prehension and perspective.[1] These are essentials in the construction of the philosophical scheme. McGilvary highlights the role of the prehension in carrying what is there and transforming it en route, in a crucial vector role to what is here in its role of feeling. To pursue Whitehead's doctrine of perspective only leads us round the full circle back to his doctrine of 'objectification'. This is in a way what we should expect from a well constructed systematic scheme of philosophy.[2]

But McGilvary found it difficult to separate Whitehead's attitude to the question of simple location from the theory of general relativity, without some emphasis being placed upon the notion of what McGilvary describes as 'matter' or 'stuff'. In Whitehead's philosophy, 'matter' has been substituted by 'actual occasions', which come into existence through the activity of prehensions. These prehensions effect, among other things, the becoming of other actual entities. What 'prehends' is the actual occasion which, McGilvary insists, does have a location in space and time, thus implying that the prehending occasion also has its own location. Hence, according to McGilvary, Whitehead's denial of the notion of simple location must be seen in the context of the denial of the presupposition of the exclusiveness of any of these supposed locations.[3] Further, it is only as a result of Whitehead's well-constructed systematic philosophy in which the actual occasion 'becomes' from other actual entities, while also leaving them where they were before, that he is able to avoid any contradiction and 'have his cake and eat it'.[4]

McGilvary does not find Whitehead's autonomy of argument convincing, for in his own experience Whitehead's statement that there is nothing apprehended in our immediate experience of the primary elements of nature which possess the characteristic of simple location, is not justified. According to McGilvary, Whitehead has relegated anything in the category of immediate experience which does not comply

1. (Schilpp, 1951, p231) 2. (Schilpp, 1951, p232) 3. (Schilpp, 1951, p230)
4. (Schilpp, 1951, p237)

with his statement on simple location, to that of 'perception' in the mode of presentational immediacy. He has then been forced to categorise immediate experience in order to strengthen his case. Thus, judging by Whitehead's own standards, which he established in stating that the verification of a rationalistic scheme should be based upon its general success, we should conclude that his doctrine of simple location is a fallacy and must be wrong. To believe in simple location on the basis of experience of things, within the category of presentational immediacy, cannot be a self contradiction. Consequently, according to McGilvary, Whitehead's doctrine should be deemed as unreasonable, on the grounds that it condemns as fallacious the presuppositions and categories of others, simply because they do not concur with one's own.[1]

The nature of both these difficulties expressed by McGilvary concerning Whitehead's philosophy of organism, are ultimately a challenge to Whitehead's entire organological scheme, because they are based upon a rejection of the fundamental concept of the whole philosophical structure of prehensions as feeling, relativity and perception based upon prehensive unification.

Percy Hughes takes a softer line in suggesting that the main weakness of Whitehead's doctrine of 'feeling' is that it is not sufficiently related to observation, concentrating too much on the association of conscious quality with cognitive quality, i.e. the necessity of being conscious for the recognition of quality. Hughes also believes there is a bias in Whitehead's association of causation generally with the mode of causal efficacy, the more primitive and basic of the two pure modes of perception. According to Hughes, these traits are included by Whitehead simply to satisfy a need to describe what does not involve consciousness of life, but which is present in all actual entities, including those we assume constitute inanimate material objects.[2]

Hughes quotes Whitehead's description of feeling as a positive prehension which both responds to data and takes them up as it participates in the active urge forward to the culmination of the act from which the feeling initially arose. Hughes notes the distinction between a responsive physical feeling and a mental, conceptual feeling. But

1. (Schilpp, 1951, p23?) 2. (Schilpp, 1951, pp290-291)

his main concern is with the distinction between conscious and unconscious feelings, for according to the Whiteheadian scheme, neither the mental nor the physical need be conscious. Whitehead's chosen example is the action in the growth of a tree, which will involve elements of both the physical and mental poles of the actual entity, culminating in the unification of the physical feelings which are then transmuted into a conceptual (mental) feeling. This conveys the information and data into the limitations of the physical world such that the nature of a specific tree can be beheld.
But according to Hughes, this still leaves the need to account for: "...the creative alchemy of germ plasm evolving new individuals and new species."[1]

2 The Actual Entity

There is a sense in which our discussions concerning prehensions and feeling have in truth been about the actual entity. However, these discussions involved a description of the genetic analysis of the actual entity as it progresses through its phases of concrescence towards satisfaction. We now turn to a consideration of the morphological nature of the actual entity as it forms the occasions of our actual world. Response to the status of the actual entity in this mode is what has become the basis for a watershed decision between its acceptance or its rejection in the role ascribed to it by Whitehead. For example, Roy Wood Sellars suggested that with a more critical epistemology united with an 'activistic' ontology, Whitehead could have incorporated his desired changes in our notions of perception, and thereby avoided his appeal to Leibnizian spirituality.[2] However, the question of the adoption of a form of Leibnizian spirituality does not simply affect Whitehead's interpretation of perception, but has an impact on the entire philosophy. This lies at the base of Pinar Canevi's question as to whether there really is any need for Whitehead's actual entity. On the basis that the purpose of philosophy is the elucidation of ordinary experience, Canevi suggests that in the presentation of the cell theory of actuality, Whitehead has failed to fulfil that fundamental task of philosophy. The introduction of the actual entity appears to increase the number of processes and entities, and thereby create unnecessary complexity.[3]

1. (Schilpp, 1951 290) 2. (Schilpp, 1951, p413)

Canevi notes that the actual entity has been compared with both the Leibnizian monad and the sub-atomic microcosmic particles posited by contemporary physics. For Canevi, deriving the notion of such a particle from mathematics or science would not present any difficulty for the philosophical world, as indeed it did not to the Greeks in the case of the atom. However, results of subsequent scientific research should warn philosophers that mistakes can occur. Even the recent discoveries of sub-atomic particles by scientists have demonstrated behaviour to confound earlier belief regarding sensed objects, showing that experiment and discovery may alter the initial notion. But Canavi is not concerned by the novelty of the new sub-atomic particles because they are still what he terms 'sensed objects', associated with the world in which we live. At the very worst these particles can only force a re-think concerning the nature of the sensible universe. However, in the case of the actual entity, Whitehead has introduced a new entity which transcends the experiences of laboratory physics, for experimental science cannot devising tests to establish its existence. What the actual entity demands is a re-think of experience.[1] The implication here is that the actual entity is postulated as a result of our experience of the world.

Describing actual entities as 'atomic' implies that they are simple and indivisible. According to Canevi, any sensed particles would have to be divisible either in practice or in theory, thus the actual entity is immediately ruled out by Canevi as potentially the ultimate ontological fact. The claim that the actual entity is the ultimate ontological fact is based upon the notion of transmutation, through which in Whitehead's philosophy of organism the elements of the sensed objects of the macrocosm are derived.[2] This implies to Canevi that, according to Whitehead, the sensed physical particles of experimental physics are made up of the imperceptible

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3. Pinar Canevi, Do we need the "Actual Entities"? In: Whitehead and the Idea of Process, First International Whitehead Symposium, 1981, Ed.: Harold Holz und Ernest Wolf-Gazo, p185.

1. Pinar Canevi, Do we need the "Actual Entities"? In: Whitehead and the Idea of Process, First International Whitehead Symposium, 1981, Ed.: Harold Holz und Ernest Wolf-Gazo, p185.

2. Pinar Canevi, Do we need the "Actual Entities"? In: Whitehead and the Idea of Process, First International Whitehead Symposium, 1981, Ed.: Harold Holz und Ernest Wolf-Gazo, p185/6.

Canevi rules out any equivalence of the actual entity with physical particles discovered

particle of the actual entity. However, according to Canevi, the only link between the two is that discovered scientific particles were once also theoretical particles.

Canevi rules out any equivalence of the actual entity with physical particles discovered as a result of scientific investigation, unless the actual entity could be deemed in some way 'sensible' on the grounds that it is necessary in the description of sensed objects. This would award it the status of a direct constituent part of sensed objects. However, this would also imply that its existence was more significant than sensed objects in so far as they owe in part their existence to it. According to Canevi, this does not seem to apply, because the actual entity is a simple complete determinate unit which is also described as in process. The process of becoming through concrescence identifies it with both being and becoming. Thus Canevi finds it of no assistance in solving the problem which already confronts sense objects. Compared with sensed objects it is less accountable because of its status as both 'being' and 'becoming'.[1]

Further consideration by Canevi of the relationship between 'being' and 'becoming, revealed that the subjective activity of becoming a unity pointed to the actual entity involving notions of both absolute idealism and also a kind of realism or naturalism. This conclusion was based upon the inseparability of the cell theory of actuality - via nexus and society - to Whitehead's epochal theory of time. It is the cell theory which identifies the actual entity as a 'determinate thing' through its completion and satisfaction in objective immortality, which is also its termination.[2] According to Canevi, it is in this completion and termination that the actual entity comes closest to a sensed object. After completion the power of the actual entity to determine disappears for it is now passive not active. This disassociates it, as a unified object, from any other unifying subject. Thus, according to Canevi: "... the unitary act of becoming and the unitary completeness of being are at variance with each other and cannot be identified with each other, ..."3 The result is an accentuation of the gap between being and

1. Pinar Canevi, Do we need the "Actual Entities"? In: Whitehead and the Idea of Process, First International Whitehead Symposium, 1981, Ed.: Harold Holz und Ernest Wolf-Gazo, p186.
2. Pinar Canevi, Do we need the "Actual Entities"? In: Whitehead and the Idea of Process, First International Whitehead Symposium, 1981, Ed.: Harold Holz und Ernest Wolf-Gazo, p186.

becoming, thereby leaving the difficulties of the sensible universe where they were.

Canevi's conclusion is that the traditional problem of the sensible universe has not been solved by the conception of the actual entity and as a result their introduction becomes an unnecessary multiplication of the problems created by Whitehead's appeal to ordinary experience. Canevi believed Whitehead had moved in the direction of science, with its recent speculation on theoretical particles, and in so doing has drawn attention to the very serious problem of 'being' and 'becoming', but that this cannot be solved by the introduction of a bifurcation of the order of being. Without the bifurcation, the multiplication of entities and processes only lead to infinite regress and the generation of pseudo problems for thought.[1] This difficulty, Canevi believes, appears to be acknowledged by Whitehead in his dissociation of the subjectivity of the process from the objectivity of the product.

The first observation on Canevi's paper which stands out above the others, is the emphasis on the critical link between epistemology and ontology referred to by Sellars. Canevi associates the theoretical particles of experimental physics with the 'sensed objects' which the 'rational man' expects to find 'in an ordered universe'. The association of these three things imply a relationship between them sufficiently strong to raise the question as to whether, in the ordered universe of the rational person, there is any room for entities which are not 'sensed objects' in the mode of perception. Canevi's view is clarified by reference to these microcosmic particles which defy the nature of sensed objects. "Now. To the extent that these particles are identified as sensed objects they too belong to the world in which we live, ..."[2] This provides a strong indication that, according to Canevi, only those things which are sensed objects, belong to the real world. To adopt such a stance appears either to overlook or reject

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3. Pinar Canevi, Do we need the "Actual Entities"? In: Whitehead and the Idea of Process, First International Whitehead Symposium, 1981, Ed.: Harold Holz und Ernest Wolf-Gazo, pp187.

1. Pinar Canevi, Do we need the "Actual Entities"? In: Whitehead and the Idea of Process, First International Whitehead Symposium, 1981, Ed.: Harold Holz und Ernest Wolf-Gazo, pp187.

2. Pinar Canevi, Do we need the "Actual Entities"? In: Whitehead and the Idea of Process, First International Whitehead Symposium, 1981, Ed.: Harold Holz und Ernest Wolf-Gazo, pp185.

all that Whitehead has been attempting to incorporate in his philosophy, for example answers to questions relating to life, consciousness, psychology and the like. However, it is the application of whether the actual entity is a sensed object used as a yardstick, that Canevi judges all his arguments for and against the value and usefulness of the actual entity as a solution to questions concerning the nature of fundamental particles. The difficulty Canevi experiences with Whitehead's description of the relationship between the actual entity as a subject in process, and therefore active, and the completion of the process in the passive state of objective immortality, is reflected in criticisms of this doctrine made by Prof. Dorothy Emmet discussed earlier.[1]

Canevi suggested that Whitehead is introducing a doctrine which leads to an infinite regress, regarding this as the result of Whitehead's involvement with the eternal, which is tantamount to a bifurcation of nature. Canevi's insistence upon the divisibility of a particle, either empirically or in principle,[2] is in fact the alternative Whitehead has already rejected, as the continual search for smaller and smaller particles is exactly what would lead to an infinite regress, unless the search was based upon the premise that there is a smallest particle in nature. This is the premise Whitehead himself adopted in his postulation of the actual entity as a theoretical particle.[3] Thus, even if Whitehead has not solved the difficulties associated with this metaphysical question, he does appear to have anticipated it, and formulated one possible solution for it, even though this has not proved to be adequate for Canevi.

The epistemology which permits Whitehead to introduce what Canevi refers to as 'Leibnizian spirituality', which in turn, Canevi believes, deflects Whitehead from re-assessing sensationalist doctrines and leads him into a form of bifurcation of nature, was not necessarily chosen as an easy option as a way out of a difficulty. The introduction of the eternal into the structure of the temporal has also revealed itself as containing inherent difficulties and weaknesses as a doctrine. We now turn to observations on, and criticisms of, this doctrine.

3. The Formative Elements of Concrescence

The notion of the formative elements in the concrescence of the actual entity, is of

1. (See this Section, p) 3. SMW p129.

those elements which participate in the concrescence of actual entities as data for the new actual entity. The ontological principle asserts that every aspect of concrescence involving the process of becoming is ultimately understood in terms of an actual entity, i.e. for actual entities to become, they require other components within the concrescence which are not themselves actual entities.[1] It is these other elements which give definiteness of form to the actual entity. The eternal, in the form of eternal objects, enters into concrescence through the second phase, as the data of conceptual feelings. It is these conceptual feelings that act as the element of the eternal in the formation of the new actual entity.

Eternal Objects are the forms of definiteness which exist as entities but which do not exist in themselves actually. They are the forms the definiteness takes, and as such are regarded as a fundamental type of entity, hence their role in concrescence is an essential one. They are 'pure potential' for the determination of particular fact.[2] But they are not limited by any form of definiteness of concrescence into which they may be lured. This demands consideration of the description and meaning of the whole category of the eternal, which includes, as well as eternal objects, the primordial nature of God, creativity and the 'one' and the 'many'.

It is from the notion of the involvement of the possibilities of all eternal objects being relevant to any act of becoming whatsoever, that logical difficulties arise.[3] For example 'Creativity', the title given to the substantial activity at the base of things,[4] is the universal of universals, which is the characterisation of the ultimate matter of fact. It is the process by which the 'many' disjunctively become the one actual occasion as a whole single unity. The process is one of creative advance into novelty. The novel actual entity is a limitation derived from the potential of all the other actual entities, the 'many', which are unified in it but from which each is separate. How does this role function in relation to the role of the primordial nature of God and God's involvement in the formation of the subjective aim which is the lure directing the concrescence?

Prof. Emmet, takes up the important question raised by McGilvary relating to the

1. MT p126/7, 2. PR p22, 3.PR p21, 4.PR p21.

location of all the potentiality of the universe, i.e. all the possibilities that could ever possibly be.[1] Rather than suggest that such potential must be physically located somewhere, Prof. Emmet suggests that they could be envisaged as simply waiting in the mind of God to be realised. The nature of God must be considered because God is the first non-temporal actual entity, and according to the Ontological Principle actual entities are the only reasons, thus the potential of the universe must be somewhere.[2] This interpretation implies that there are no new eternal objects, which raises the question of creation being limited to a finite number of possibilities, for however large the number of eternal objects may be, if they are numerically finite and limited, then so will be the options for the nature of creation.[3] In that case there would be a probability of the recurrence of some particular order.[4] Prof Emmet regards the notion of the 'subsistence' of these potentials in the mind of God as a 'fudge', for it would seem to imply that something can appear in the actual world out of nothing.[5] Such an interpretation would be quite contrary to the spirit of Whitehead's doctrine, which is an attempt to prevent that very notion. For this reason Emmet deems it reasonable to conclude that Whitehead has hardly dealt with these consequences adequately.

Prof. Emmet suggests that there are at least three possibilities to describe the nature of the role of eternal objects, as they appear in Whitehead's philosophy. The first is to adopt some form of Platonic realism. However, for Plato the 'real world' never equates directly with the absolute perfection of the eternal, whereas in the Whiteheadian system there is a much closer relationship of dependence between the two, thus presenting a major contra- indication for this interpretation. The second alternative is to follow the lead of Santyana in describing the eternal as the real essence, as the subsistence of the 'forms' of Plato. Emmet regards Whitehead as having already rejected this , because the forms have no necessary connection or 'participation' in the world which is 'becoming'.[6] The third alternative interpretation is derived from the way Whitehead presented the relationship, especially in his earlier

1.(Currently Sides 6 - 8)
2. PR pp24 & 46, (This doctrine is formulated in the 18th category of Explanation.)
3.(Emmet, 1966, p117) 4. (Emmet, 1966, p118) 5. (Emmet, 1966, p119)
6.(Emmet, 1966, p138)

works, of eternal objects as recurrent types of uniformity revealed within the process, but as having no status outside the process.[1] She regards this as complying with Whitehead's statistical theory of the laws of nature, describing average uniformities of actual occasions and societies. If this role were adopted, the whole process would then display recurrent types of uniformities which could be given names as they are recognised.[2] The net result would be that the eternal object would not be deemed to exist until it found exemplification in the actual world.[3] This third alternative also appears to comply with the ontological principle.

Ivor Leclerk also turned to the ontological principle for a solution to the difficulties encountered concerning eternal objects, for to become a fact in the concrescence of the actual world, an actual entity must have a determinate form. He reminds us that the actual entity achieves its form by the selection of the appropriate eternal objects, thus the decisions in the process of becoming concerns the very nature of the actual entity, i.e. its mode of existence is to be conceptually prehended or mentally envisaged. However, in the case of eternal objects, although they are themselves above change because they are eternal, they are also involved in the process of change. Thus, their mere introduction may not be sufficient to explain the relationship of the eternal with the temporal, for the significant question as to whether their use in the philosophy answers the questions which they were formulated to solve, remains. In short, the question regarding the status of the eternal objects in relation to the concrescence of the actual entity still remains.[4]

According to Victor Lowe, some scholars have argued that the complexity of the descriptions of eternal objects and their role in concrescence of the eternal with the finite, temporal world, is simply too intellectual. In Whitehead's scheme, eternal objects represent the category of Universals, for such an element is essential in the subject matter of cosmologies. In so far as it is true that everything has its own particular characteristics, some philosophers have been persuaded in favour of the extreme position, that all such are particular characteristics and confined to their own

1. (Emmet, 1966, p107) 2. (Emmet, 1966, p107) 3. (Emmet, 1966, p108)
4. (Ivor Leclerc, 19 pp196-202)

particular subject, rather than being universals. Whitehead took the extreme opposite

view in his doctrine that the world is a process made up of individual processes, and nothing in the world could be a definite entity unless it was exemplifying a form of definiteness free from temporal limitation.[1]

Lowe questions whether in his interpretation Whitehead might not have been converting what is a necessary step in conceptual thought, into a necessity for metaphysics. Thus the result in his scheme is that eternal objects become 'ideal' entities and not actual in the actual world, though they are still regarded as in everything which is part of the actual world, in spite of the fact that they do not do anything.[2] This interpretation would agree with Whitehead's doctrine that only actual entities act. Yet in spite of these doctrines, when writing about eternal objects Whitehead either suggests too much for them when they are 'agents', or too little when they express only the definiteness of actualities.[3]

Lowe concludes that this must be Whitehead's way of expressing the definiteness of actualities in conformity with his doctrine that: "...eternal forms of definiteness are exemplified in actualities".[4] According to Lowe, this is an important point for metaphysics, for Whitehead often claims that without such forms of definiteness there would be no possibility of a description of rational things. Lowe is not convinced by this conclusion, and states that, even if it were true, it would not prove that forms of definiteness in the universe are eternal. However, even if they are not, we should either write metaphysics as if they were, or stop writing metaphysics altogether.[5]

Prof. Jan Van de Veken questions whether Whitehead has really developed the notion of God completely along the lines dictated by his metaphysics or whether there is not strong evidence to suggest that he has also included in the idea of God a distinctive

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1. Victor Lowe, The Approach to Metaphysics, In: The Relevance of Whitehead, (Ed. Ivor LeClerk) pages 193-216. 2. RM p90
3. Victor Lowe, The Approach to Metaphysics, In: The Relevance of Whitehead, (Ed. Ivor LeClerk) p212.
4. Victor Lowe, The Approach to Metaphysics, In: The Relevance of Whitehead, (Ed. Ivor LeClerk) p212.
5. Ibid. Victor Lowe, The Approach to Metaphysics, In: The Relevance of Whitehead, (Ed. Ivor LeClerk) p213.

religious, theistic element. There is also ambiguity as to whether the primordial nature

of God is ultimately synonymous with creativity, even though God represents the first or prime example of it.[1] In other words Whitehead does not appear to be consistent in applying his word 'God'. According to Prof. Van de Veken, the first meaning of the word 'God' is the rational development from Whitehead's metaphysics, derived from his aim simply to express the general concepts which are required for things internal to the universe. By 'internal' he means what is included in the universe. Whitehead's intention is to employ: "...the science which seeks to discover the general ideas which are indispensably relevant to the analysis of everything that happens."[2] This provides clear indication that Whitehead's God is the result of his metaphysics.

However, Van de Veken argues that Whitehead also allows the 'religious' idea of God to slip into his work in a way which goes far beyond any concept of God which could be justified from the principles of limitation or concretion. There are occasions when the implied meaning of the word God is not derived from metaphysics but religious experiences which provide other 'independent' evidence for the nature of God over and above anything that could reasonably be said concerning God from Whitehead's notions of creativity and the principle of limitation. Van de Veken attributes this duality of meaning to Whitehead's failure to recognise that the word 'God' has many different meanings in traditional usage.[3]

The result of this duality in Whitehead's metaphysics according to Van de Veken, is that there are two distinct ways in which the metaphysics can be developed in order to make them more coherent:

> "...the first is to allow God to encroach on the role Whitehead assigned to creativity so that God is in fact universal, or eminently creative, and for that reason an essential metaphysical ultimate of the system. The other possibility is to make the system coherent by stressing the role of the creativity and accepting that the universe does not provide for the features that religion normally attaches to the notion of God."4

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1. Prof. Van de Vaken, Whitehead's God is not Whiteheadian Enough, In: Whitehead and the Idea of Process, Ed. Harold Holz and Ernest Wolf-Gazo, First International Whitehead Symposium, 1981, p300/301, 2 MT p82,
3.Prof. Van de Vaken, Whitehead's God is not Whiteheadian Enough, In: Whitehead and the Idea of Process, Ed. Harold Holz and Ernest Wolf-Gazo, First International Whitehead Symposium, 1981, p301.

In order to clarify Whitehead's metaphysics regarding the ultimate while avoiding the creation of a theology rather than a cosmology, Van de Veken proposes a re-reading of the appropriate Whiteheadian texts.[1] The result, which would have to be such that a non-theist would still be satisfied with the metaphysics, should be the establishment of metaphysics relieved of the 'God-problem' which emanates from an overlap of the roles of God and Creativity.[2]

An important point, which has arisen from these observations, is that focusing on the roles of the three formative elements, it is apparent that the true relationships between them, which includes a demarcation between roles, has not been made absolutely clear by Whitehead. What is clear is that it is from their mutual interaction that the whole universe of actual entities is derived. Eternal objects have a crucial role in the concrescence of the new actual entity providing a connection between eternal objects and God, which links potentiality and actuality. The relationship between God and Creativity is provided by novelty and the lure of eternal objects into concrescence, for: "Apart from the intervention of God, there could be nothing new in the world, and no order in the world."[3]

4 Transmutation and Perception

There have already been several references to transmutation in this section, including those by Percy Hughes[4] and Pinar Canevi,[5] but in this part we will be concentrating upon papers by James S Felt entitled 'Transmutation and Whitehead's Elephant', and that of Roy Wood Sellars entitled; 'Philosophy of Organism and Physical Realism'.

Transmutation is the operation, described in Whitehead's philosophy of organism, by

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4. Prof. Van de Vaken, Whitehead's God is not Whiteheadian Enough, In: Whitehead and the Idea of Process, Ed. Harold Holz and Ernest Wolf-Gazo, First International Whitehead Symposium, 1981, p303,
1. Prof. Van de Vaken, Whitehead's God is not Whiteheadian Enough, In: Whitehead and the Idea of Process, Ed. Harold Holz and Ernest Wolf-Gazo, First International Whitehead Symposium, 1981, p303,
2. Prof. Van de Vaken, Whitehead's God is not Whiteheadian Enough, In: Whitehead and the Idea of Process, Ed. Harold Holz and Ernest Wolf-Gazo, First International Whitehead Symposium, 1981, p308,
3. PR p247, 4. (Section 11 Side 9) 5. (Section 11 Side 12)

which an aggregate of many actual entities in the form of a nexus are prehended in a single macroscopic entity rather than as an aggregate. It is the transition from the microscopic to the macroscopic. It was one of Whitehead's the main criticisms of the Leibnizian monadology, that his monads were conceived best as mentality, while the physical aspect, as 'physical' is generally understood today, was only a secondary derivative element.[1] Transmutation is the way in which the philosophy of organism overcomes the difficulty common to all monadic cosmologies.[2] However, according to James S Felt: "Even if Whitehead has given an account of how a Leibnizian doctrine of 'confusion' of experience can be analysed, the resulting experience seems nonetheless to remain confused."[3] Felt found some difficulties with Whitehead's corrections when he questioned how transmutation actually works, so that we are able to sense, and in particular in this case see, a large grey body such as an elephant.[4]

Felt highlights his particular difficulties with colour and the sense of sight, concentrating on the grey of the elephant. He discovered that a description of the process reveals a uniformity between the physical and conceptual feelings through the inclusion of the same eternal object, grey. The visual organs of the body, in prehending these actual occasions, also feel the grey of the constituent occasions of the elephant's skin. The eternal objects are seen to be performing a two-way operation by both qualifying the subjective experience of the individual occasion and also in serving as the link which enables one occasion to become objectified in another.[5] It is then that transmutation takes place. Whitehead made it clear that the conceptual feeling is indifferently felt, so will be the case in the feelings we may have of the constituent occasion which is the actual elephant. The transmutation of the conceptual feeling is on the basis that it characterises the nexus which is the complexity of occasions. Thus, all feelings of the constituent actual occasion of the elephant's skin as 'grey', are derived from the transmuted feeling as the characteristic of the new nexus, which is the

1. PR p19, 2. PR p27, (These matters were discussed in Section 2.7)
3. James W. Felt S.J., Transmutation and Whitehead's Elephant, In: Whitehead and the Idea of Process, Proceedings of the first International Whitehead Symposium 1981, Ed. Harold Holz and Ernest Wolf-Gazo, p181.
4. James W. Felt S.J., Transmutation and Whitehead's Elephant, In: Whitehead and the Idea of Process, Proceedings of the first International Whitehead Symposium 1981, Ed. Harold Holz and Ernest Wolf-Gazo, p180,
5.PR p251.

complexity of occasions i.e. the corpuscular society which accounts for the skin.[1]

Felt's primary concern in Whitehead's description is the ability of actual occasions to be felt as 'grey'. It is a task Felt regards as impossible according to Whitehead's description. That recounts the functioning of actual occasions, as the ultimate constituents of the nexus, forming the corpuscular societies which constitute the body of an elephant' for thet are conceived as smaller than the atom or the electron. But the atom of modern physics is not conceived as possessing the quality of colour, a quality attributed to the macroscopic bodies of the objects of our experience i.e. the atom is not associated with microentities. However, in Whitehead's system, it is exactly this characteristic, denied by modern physics, that is required by his actual occasions. Thus, Felt argues that Whitehead's system cannot explain the visual experience of a grey macroscopic object such as an elephant.[2]

A second and related difficulty concerns the impression of a naïve realism within Whitehead's doctrine. If the colour grey is part of or an ingredient in the conceptual feeling of the entities which constitute the elephant's skin then it is already present in the elephant before it is prehended through the act of perceiving i.e. the same colour grey is already in the elephant before it is perceived in the act of perception. According to Felt, Whitehead is here proposing a kind of objectivism which had been discredited by Galileo and Newton three hundred years ago. The result of their deliberations meant that we should not think in terms of the grey out there in the elephant, it is manifest only in the sensed elephant.[3]

Before proposing his own possibility of an explanation, Felt makes it quite clear that he is not advocating the wholly subjective philosophy which emanated from Newtonian

1. James W. Felt S.J., Transmutation and Whitehead's Elephant, In: Whitehead and the Idea of Process, Proceedings of the first International Whitehead Symposium 1981, Ed. Harold Holz and Ernest Wolf-Gazo, p180.
2. James W. Felt S.J., Transmutation and Whitehead's Elephant, In: Whitehead and the Idea of Process, Proceedings of the first International Whitehead Symposium, 1981, Ed. Harold Holz and Ernest Wolf-Gazo, p181
3. James W. Felt S.J., Transmutation and Whitehead's Elephant, In: Whitehead and the Idea of Process, Proceedings of the first International Whitehead Symposium, 1981, Ed. Harolz Holz and Ernest Wolf-Gazo, p181

Physics in the works of Descartes and the empiricists Locke and Hume:

> "There is a third possibility: gray is neither simply in the physical elephant, the elephant as it is in itself, nor purely in the eye of the beholder. Gray is in the seen-elephant, the elephant-in-relation-to-the-seer, and that of course involves the seer as well as the elephant. In other words, color in the most proper and concrete sense is neither a simple objective ingredient of a macroscopic object, nor is it an interior phantasy (however provoked) in the viewer. It is rather a characteristic of the object precisely and only in its relationship to the seer within the very act of seeing. The seen elephant, which in fact is gray, is the real elephant but not the Elefant-an-sich."[1]

Felt believed that Whitehead's theory of transmutation was not capable, as presented, of incorporating such a necessary critical realism as Felt had just described.

According to Felt, the result of Whitehead's account makes experience appear as an illusion, for the 'grey' doesn't belong to the nexus as such, but rather to the individual constituent occasions. Transmutation seems to be an operation taking place within the perceiver, without the need of invoking any other ontological theory to cement every thing together i.e. the actual entities of the nexus with the eternal object 'grey'. Whitehead's description suggests to Felt that the skin of the elephant is a nexus of innumerable microscopic actual occasions whose physical and conceptual feelings, uniformly revealing the eternal object 'grey' as an ingredient: "...are somehow blurred by the perceiver into gray belonging to a macroscopic elephant."[2]

Like Prof. Emmet, Felt has assumed that 'atomicity' means sub-atomic particles, forces and reality. He cites several other commentators who regard Whitehead's description as inadequate. The list includes Ivor Leclerc and Bradford Wallock. The former he quotes as saying that although Whitehead has attempted to avoid the phenominalism of Leibniz by stating that a society or body is an aggregate, in the sense that it does not truly constitute a single entity, for the unity of the total society is a feature of each component actual entity, he has not in reality avoided phenominalism. From Bradford Wallack, Felt refers to his description of Whitehead going against common sense as well as some of Whitehead's own earlier doctrines.[3] Felt notes the

1. James W. Felt S. J., Transmutation and Whitehead's Elephant, In: Whitehead and the Idea of Process, Proceedings of the first international Whitehead Symposium, Ed. Harold Holz and Ernest Wolf-Gazo, 1981, p181.
2. James W. Felt S. J., Transmutation and Whitehead's Elephant, In: Whitehead and the Idea of Process, Proceedings of the first international Whitehead Symposium, Ed. Harold Holz and Ernest Wolf-Gazo,1981, p182.

alternative theories suggested by Ivor Leclerc, Edward Pols and Paul Weiss, in order to alleviate the difficulties involved in Whitehead's description of Transmutation.[1]

This alternative interpretation of perceiving the grey of an elephant as proposed by Felt, could hardly be described as an 'ad hoc' theory posited in order to smooth the difficulties concerning one particular description of Whitehead's whole philosophy. Rather, it should be recognised as an alternative which so fundamentally challenges Whitehead's thesis that to adopt it is to reject Whitehead's organological philosophy. No explanation which challenges the fundamental relationship between the mutual dependence of actual entity, nexus and society, could be countenanced without also challenging the validity of the concept of organism as a whole, as the basis of a cosmology.

The link between Whitehead's doctrine of transmutation, the way we see and what we see, is clear from the discussions of Felt. Roy Wood Sellars welcomed Whitehead's thesis in Process and Reality because throughout his developing scheme any reader will encounter a series of challenges which force the reader to re-investigate his own pre-conceived notions and doctrines:

> "The reader is, ... I think, conscious of the basic choices being made all along the line and of the motivations, scientific, epistemological, logical and ontological, dominating the perspective."[2]

The particular concern of Sellars is in Whitehead's reaction against the sensationalist doctrine and scepticism of Hume, hence his own aim, as a 'reformed materialist', was to demonstrate that his philosophy was a superior form of organological philosophy to that of Whitehead's 'atomic' philosophy, which he described as based upon subjective realism.[3] From this task he hoped to establish greater clarification of Whitehead's philosophy of organism.[4]

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3. James W. Felt S. J., Transmutation and Whitehead's Elephant, In: Whitehead and the Idea of Process, Proceedings of the first international Whitehead Symposium, Ed. Harold Holz and Ernest Wolf-Gazo,1981, p184.
1. James W. Felt S. J., Transmutation and Whitehead's Elephant, In: Whitehead and the Idea of Process, Proceedings of the first international Whitehead Symposium, Ed. Harold Holz and Ernest Wolf-Gazo,1981, p183/4.
2. (Roy Wood Sellars, Philosophy of Organism and Physical Realism, Schilpp, p408)

Sellars regarded Whitehead's thesis, that sense perception is a more superficial means of knowing than the more basic intuition of process, as an outstanding feature. He expressed agreement with Whitehead in his rejection of Humian sensationalism. His main concern was that Whitehead had rejected the category of substance, where substance is interpreted as simple endurance. Sellars' question is whether Whitehead's rejection would not have been more rewarding if it had led to a reformulation of the doctrine of substance, rather than a rejection of it. Through such a reformulation Sellars believes Whitehead could have arrived more quickly at a superior form of organological philosophy.[1]

According to Sellars, Whitehead appears to commence from what he refers to as a 'neo-realistic modification of idealism'. The first concern as a 'critical realist' is Whitehead's attempt to substitute 'substance' with his own philosophy of organism based on the actual entity, prehensions and nexus and the ensuing notion of 'togetherness'. The 'togetherness' relates to the within of the concrescence, the actual entities having involvement with one another as a result of their prehensions. For Sellars, the difficulties of Whitehead extending this doctrine to contemporary entities involves time, for concrescence involves the new actual entity taking up its data from the antecedent universe. Sellars refers to this as 'a backward glance to the immediate past', which in the creation of the present, becomes the basis of Whitehead's formulation of the relativity theory. According to Sellars, the role of relativity in Whitehead's doctrine of perception can best be understood in terms of the mode of presentational immediacy. But it is this mode which includes symbolism and categories such as that of endurance, thus focusing attention again upon what it is that endures. According to Sellars, this is a fundamental difference between Whitehead's philosophy, which he refers to as a hypothetical form of neorealism, and the doctrine of a critical realist like himself, of a 'nonapprehensional' type of knowing.[2]

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3. (Roy Wood Sellars, Philosophy of Organism and Physical Realism, Schilpp, p410) Sellars describes his own version of a Critical Realist as being part of a movement, the aim of which is to reform representative realism by doing justice to the different factors and distinctions elicited by reflection, through a careful study of perception.
4. (Roy Wood Sellars, Philosophy of Organism and Physical Realism, Schilpp, p407)
1. (Roy Wood Sellars, Philosophy of Organism and Physical Realism, Schilpp, p408)
2. (Roy Wood Sellars, Philosophy of Organism and Physical Realism, Schilpp, p412)

Sellars regarded Whitehead as being in error when taking the side of those who criticise the correspondence theory of truth.[1] Sellars rejects Whitehead's attempt to account for 'presentationalism' through prehensions, becoming and subject-superject, but as a critical realist, for any theory of truth to have credibility it must assign a fundamental role to sensory presentations,[2] and rely upon empirical evidence.[3] Knowledge implies similarity and that implies that sensory presentations are the appearances of things.

According to Sellars, the reduction by Whitehead of the category of substance to one of simple endurance, is the result of something more ultimate than anything involved in a sensationalist, realist perspective. Sellars believes that it has been adopted from the 'spirituality' of Leibniz. If Whitehead's term the 'bifurcation of nature' is used to challenge Cartesian dualism, then evolutionary naturalists can agree with him. If it means the abandonment of the traditional distinction between primary and secondary qualities, because the distinction has no congruence with prehension and idealism, then Sellars can accept that. But if it means that a re-analysing and reformulation of representative realism is required then Whitehead's complicated philosophy of organism is totally unnecessary. According to Sellars, what Whitehead has failed to realise is that the first concern of a critical realist is to reform representative realism. This is achieved by: "... doing justice to the factors and distinctions which reflection elicits in a careful study of perceiving."[4]

The primary thesis of Sellars is that: "...perceiving is denotative, depictive and judgmental and that sensory presentations are used as guides, symbols and bases of judgmental characterisation." It is also free from Cartesian dualism. Sellars wished to demonstrate that a different epistemology, united with a more activistic ontology can

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1. According to the correspondence theory: "...propositions are true if and only if they correspond with the facts. However, despite its immediate appeal, the account has met with a number of objections, both the conception of facts as worldly items, and the construal of truth as a relation, drawing criticism."
Bede Rundle, Trinity College Oxford, In: The Oxford Companion to Philosophy, Ed. Ted Honderich, Oxford University Press, 1995 p166.
2.(Roy Wood Sellars, Philosophy of Organism and Physical Realism, Schilpp, p418)
3.(Roy Wood Sellars, Philosophy of Organism and Physical Realism, Schilpp, p420)
4. (Roy Wood Sellars, Philosophy of Organism and Physical Realism,Schilpp,p410)

avoid both Cartesian 'picture-thinking' and Whitehead's alternative. His new was the reform of the category of substance without following Leibniz into spiritualistic pluralism.[1] The type of critical realism would substitute for Whitehead's togetherness and internal relations, the distinction between what he calls: "...different species of relations"[2] some of which are revealed through mental activity or comparisons. By distinguishing between different kinds of relations, Sellars believes he can partially account for: "...the unity and togetherness intrinsic to substance."[3] His third type of relationship he describes as: "... relational feelings and felt compresence in consciousness". Sellars believes through combinations of these relationships he can account for Whitehead's experiential togetherness, which involves the psychological and the aesthetic.[4] His mental relationships making judgmental decisions possible are the result of: "...physical connections between reformed substances."[5] This satisfies Sellars' notion of the human organism, which is an emerging substance, integrated and whole, with the necessary powers and dispositions associated with its unity. Declared facts simply concern objects. Sellars rejected any 'literal' link between a claim to knowledge and an object, a constituent of which relates to the eternal.

In his approach as a critical realist, Sellars has stressed organisation and integration, hence the rejection of eleatic materialism,[6] but this does not necessarily lead us into subjectivism and an atomic ontology. It is possible that the 'togetherness' of different components in nature could be one of new and intimate sets of relations, producing a genuine unity which has its own characteristics and properties. In this way the human organism may be regarded as an emergent substance.[7] Sellars believed that Whitehead had not done justice to the notion of an enduring self,[8] concluding that, with emphasis

1.(Roy Wood Sellars, Philosophy of Organism and Physical Realism, Schilpp, p413)
2. (Roy Wood Sellars, Philosophy of Organism and Physical Realism, Schilpp, p413)
3. (Roy Wood Sellars, Philosophy of Organism and Physical Realism, Schilpp, p414)
4. (Roy Wood Sellars, Philosophy of Organism and Physical Realism, Schilpp, p414)
5. (Roy Wood Sellars, Philosophy of Organism and Physical Realism, Schilpp, p414)
6. p408/9, Eleatic refers to a philosophy of extreme monism started by Parmenides in Elea, South Italy in the 5th Century BC. "Parmenides held that reality must consist of a single undifferentiated and unchanging object,..."
A. R. Lacey, A Dictionary of Philosophy, Third Edition, Routledge, 1996, p87.
7.(Roy Wood Sellars, Philosophy of Organism and Physical Realism, Schilpp, p414)
8 (Roy Wood Sellars, Philosophy of Organism and Physical Realism, Schilpp, p415)

on organisation, his own scheme produces a better description of an organism than Whitehead's.[1]

Sellars described his thesis as a critical realist presenting a version of 'representative realism'. For Sellars, Whitehead was 'belittling' sense perception and its accompanying categories. However, a more critical development of the categories of sense perception means that the organic self is simply one part or thing, among other things, in their environment. Thus, according to Sellars, it is Whitehead's notion of perception which is the stumbling block to any acceptance of his organological thesis.[2] There should be a re-analysis of perception in order to discover the categorial ingredients of its judgmental characteristics and thereby link its epistemology with a materialistic ontology.[3]

Summary

In this section we have considered various criticisms directed at aspects of Whitehead's oganological thesis. The first concerned the choice of the word 'feeling' to describe the way in which the new entity experiences the antecedent universe. One aspect questioned the suitability of the word to describe the task and another the ability of that word or any other, to perform the task. The second challenge questioned the need for the postulation of the actual entity at all, on the grounds that the notion of the metaphysical actual entity was an unnecessary complication because it failed to answer the questions for which it was conceived and also because there was little justification for it from our experience of the world or from science generally. The theoretical particles of physics were better placed to complete the task than any metaphysical particle rationally conceived for the role. The third aspect of Whitehead's thesis to be challenged was the inclusion in his scheme of the eternal. Consideration of the need to include the eternal was followed by a longer discussion on the ambiguity of the relationships between the different aspects of the eternal that Whithead included under his heading of the 'formative elements'. The conclusion was that the roles of the three elements were not adequately defined. The fourth challenge was to the notions of

1. (Roy Wood Sellars, Philosophy of Organism and Physical Realism, Schilpp, p418)
2. (Roy Wood Sellars, Philosophy of Organism and Physical Realism, Schilpp, p421)
3. (Roy Wood Sellars, Philosophy of Organism and Physical Realism, Schilpp, p422)

'transmutation' and 'perception'. The main case against the doctrine of transmutation was founded upon its inability to provide a satisfactory explanation of the way in which the metaphysical actual entity became the actual occasions of our actual world. Whitehead's scheme did not appear any more feasible than that of Leibniz, which Whitehead had devised his own to replace. This was followed by a plea for the abandonment of Whitehead's unnecessarily complicated philosophy of organism in favour of an adapted and modified sensationalist doctrine which could more quickly and easily provide answers to questions of an organological nature.

11. Arguments in support of Whitehead's main thesis.

This section will provide a response to the challenges made in the previous section. In some cases the response will be derived from possible solutions offered by the original philosopher highlighting the difficulties. In other cases, possible answers and solutions may be tendered by other philosophers. The order in which the issues are discussed will remain the same as in the previous section, 'feeling', the 'actual entity', the 'formative elements' and 'transmutation' and 'perception'.

Feeling

In the first part of this section reference will be made to evidence provided by Whitehead concerning his selection of the word 'feeling' to describe the role of the positive prehension. This will be followed by consideration of firstly, whether it is a suitable word for that task and secondly, whether there is any word available with sufficient scope to accomplish the task.

Whitehead made it clear that it was only after consideration of other options that he chose the word 'feeling' to represent the relationship between prehensions. His conclusion was that the word 'feeling' comes nearest to describing the desired notion. Though it is similar to Henri Bergson's 'intuition',[1] acts in a role similar to that of Samuel Alexander's 'Enjoyment';[2] is related to the 'perception' of Leibniz,[3] also to Locke's notion of 'idea',[4] and is nearest of all to the Cartesian notion of 'feeling' as used to describe the sense of warmth from a fire,[5] none of these alone, encompass entirely all the facets and meanings that Whitehead desired. Within the philosophy of organism the word 'feeling' has to cover a wide variety of philosophical notions, all of which must relate to the thing which is to pass from one to another. The essence of an actual entity is based entirely on its nature as a prehending thing and a 'feeling' belongs to the positive species of prehensions.[6] Whitehead expected the reader of Process and Reality to develop a clearer understanding of the word 'feeling' by a process of gentle revelation of its meaning as progression through the explanations of the philosophy took place. Such a process of development was to apply in the case of other words in the 'Categoreal Scheme' after they had been first encountered.[7]

1. PR p107, 2. PR pp28 & 41, 3. PR p80, 4. PR p52, 5. PR p219, 6. PR 41.

Each actual entity is an act of experiencing which arises out of data in a process of feeling. Absorbing such data into a unit enables that unit to achieve its satisfaction within the concept of the subjective aim. Hence the term 'feeling' is used for the basic generic operation of passing from the objectivity of the data to the subjectivity of the particular actual entity in question.[1]

According to the philosophy of organism, it is through 'feeling' that the final satisfaction of the actual entity is achieved.[2] But the process of concrescence cannot be described in terms of a simple description of the stuff or matter of the universe: "Feelings are variously specialised operations, effecting a transition into subjectivity. They replace the 'neutral stuff' of certain materialistic philosophers. An actual entity is a process and is not describable in terms of the morphology of a 'stuff'".[3]

As a result, we may say, feeling expresses the process of concrescence as more truly representing how the actual world should itself be regarded as an actual entity. The Category of the Ultimate expresses the General Principles which are contained in the other three categories of 'Existence', 'Explanation' and 'Obligation'.[4] The Ontological Principle makes clear that the world simply operates through the same process on a larger scale. Recognition of this scale enables the recognition of Witehead's Metaphysical Principle', which states that 'being is a potential for becoming'.[5] This implies that new worlds are continually coming into existence as the fulfilment of the potential of previous worlds and which in themselves contain the potential for the new worlds. Thus, according to Whitehead, it is the word 'feeling' that best describes this process in which actual entities constitute the actual world and provide for the subsequent world.[6]

Whitehead's choice of the word 'feeling' to describe that part of the creative urge which plays such an important role in the phases of concrescence, but which also has to account for everything from the atoms and molecules we discover in pulsating vibratory energy, to the value and emotive feeling in the macro world of enduring objects, has proved to be a controversial choice.[7] The word feeling in everyday usage

7.Pref. p xii, 1. PR 40, 2.PR p190, 3.PR p40, 4. PR p21, 5.PR p45, 6. PR p40.

is often associated with some form of subjective awareness of concepts of value or quality. In that sense the word feeling is much more than the immediate notion of a human sense of touch or its containment in the narrow concept of human emotion.

According to Whitehead 'feeling' is used in the philosophy of organism in order to accommodate an indefinite number of categories of existence. For example, the synthesis of entities into 'contrasts' will tend to produce new types of existence, as is the case with 'propositions'. It is only necessary to consider a few types of existence, used as a representative sample, to illustrate that there will be many types as derivatives of any one major type. Thus, a feeling as a positive prehension is a transition which enables a concrescence to take place. It represents the appropriation of some elements of the world to be components in the internal constitution of a new actual entity as subject. The different elements of the universe are what the feeling feels.[1] Hence, the universe always remains one and cannot be comprehended other than through actual entities, which are the means by which it is unified. Further, the universe is always new as a result of the superjective characteristic of feeling in concrescence which are the novelty. The immediate novelty manifests itself in the subjective form of the actual entity and nexus, the novelty and the concresence being inseparable and unique to that immediate present: "It is enveloped in the immediacy of its immediate present."[2] A description of the process understood genetically relates how, after origination of the subjective form, the history of the feeling would reveal how the feeling, feels. This would in turn express how the feeling came into being, what purpose urged it forward, as well as the impediments and indeterminations it encountered.[3]

In is the objective determination of the actual entity through its participation in the self- realisation of other actual entities, through its capacity as determinant of actual entities, that enables explanations of characteristics of the actual world to be formulated. This is the process for any explanation of truth and falsehood, for detached from reality truth and falsehood are meaningless. It also provides an opportunity for the operation of a 'final cause', as the actual entity passes into objective immortality

7.PR p23, 1. PR 231, 2. PR 232, 3. PR 232.

on completion of the process. The accumulation of the definiteness which is attained in this way increases the real potentiality of the universe.[1]

These doctrines of concrescence are formulated on the basis of the fundamental doctrine of relativity. They offer an explanation of the relationship of the micro and the macro world, while avoiding the dichotomy experienced between the two in modern physics. However, as we have just recognised: "There are an indefinite number of types of feeling according to the complexity of the initial data which the feeling integrates, and according to the complexity of the objective datum which it finally feels."[2] All these feelings have to be transmuted from the metaphysical realm to that of the actual world. This is the process which may be regarded as the equivalent in the philosophy of organism to the aforementioned dichotomy of physics,.

In so far as, in the philosophy of organism, each act of creation is social effort which involves the whole universe, the new actualities add new conditions which can be absorbed into the fullness of the universe. 'Evil' can thus be explained as the birth of a new actuality in the wrong society at the wrong season, which may cause a delay or the inhibiting of the creative advance. However, such a holding back will be compensated for by a richer, fuller more stable advance later. According to Whitehead it is for this reason that there can be a conviction in the ultimate transcendence of the creative advance over 'evil'.[3]

In the previous section the main criticism of the notion of 'feeling' was not in fact that the word itself was in some way 'wrong' or unsuited in its role, but rather that no word is available to describe both the physical nature of the actual world as well as the conceptual, which in Whitehead's philosophy is associated with value, emotion and aesthetics, as well as consciousness and life. In an attempt to find some justification for Whitehead's use of the term for both physical and psychological process, our attention is directed back to Whitehead's appeal to the work of Francis Bacon,[4] thus clearly associating feeling with perception. Wolfe Mays reminds us that it was Whitehead's recognition that the use of the word 'perceive' includes the idea of

1.PR p223, 2.PR p232. 3.PR p223, 4.SMW pp52-57,

cognitive apprehension that made him search for a replacement, for he clearly believed that we also take into ourselves other perceptions of which we are not aware. Whitehead chose the word 'prehension' to represent such uncognitive apprehensions.[1]

Mays describes Whitehead as having introduced physical prehension or feeling to account for what are essentially causal transactions of both physical nature and the reactions of biological organisms and perception, cognition and judgements in humans. Thus, it may well be for this reason that Whitehead also introduced his distinction between 'simple' and 'complex' physical feeling, where the former are involved with the transference of energy from entity to entity, as represented in physical nature, and the latter represent the energy involved in the transference of emotional energy which is over and above the merely physical transaction. Further, Mays suggests that in order to avoid the accusation of 'anthropomorphism' Whitehead could draw on an analogy between the two, as both involve a transference of energy, one in the form of a physical system and the other as a stream of sensory experience. This cements a link between the basic elements of the physical world through simple physical feeling, and the emotional experiences of humanity through complex physical feelings.[2]

According to Lewis Ford, the context of the use of the word 'feeling' in the philosophy of organism, suggests that although Whitehead's intention is really to convey the notion of something felt, it is not intended to be in a subjective, effective state. The word is ultimately derived from Whitehead's change of the earlier word 'transition' for 'concrescence'. The title of 'supersession' was given to the former role of 'transition',[3] while the word 'feeling' was then introduced within the new role of concescence. We noted earlier that Prof Emmet regarded that as more of a 'picking up' rather than simply a 'passing on' in the process feeling. It is through the re-iteration of the pattern of the actual entity that its successor is able to 'feel' the

1. Wolfe Mays, Whitehead's Philosophy of Science and Metaphysics, Martinus Nijhoff, The Hague, 1877, p97.
2. Wolfe Mays, Whitehead's Philosophy of Science and Metaphysics, Martinus Nijhoff, The Hague, 1877, p98.
3. Lewis Ford, 'From Transition to Concrescence', In: Whitehead and the Idea of Process, Poceedings of the first International Whitehead Symposium, Ed. Harold Holz and Ernest Wolf-Gazo, 1981, p87-89.

feelings of its predecessor. Thus the word 'feeling' was chosen to represent the means of the completion of this re-iteration.[1]

William A Christian suggests that we ought not to read too much into Whitehead's systematic terms, for example 'feeling', for Christian is convinced that Whitehead regarded the best starting point for his philosophy as being from aesthetics.[2] Thus, an aesthetic interpretation should become the paradigm of the interpretation for the whole philosophy. 'Experience' is not a systematic term. However, in 'Adventures of Ideas' Whitehead has to a great extent substituted 'actual occasion' for 'occasions of experience'. This is possibly the reason why 'experience' doesn't appear in his categories of existence, explanation or obligation. It could also be a reason why Whitehead introduced the term 'feeling', for it is as a result of its generality that it can be made to apply to both electrons and stars as well as human experience.[2]

Christian demonstrates the way in which, through the notion of 'immediacy' and the explanation of the actual entity as an 'entity for itself',[4] there is a movement in the direction of concepts which can apply beyond that of our 'normal' frame of reference. Though it is clear that the 'Categorical Scheme' must apply to all things, we should remember that prehensions are rarely conscious.[5] Hence, the question is whether or not the Categorial Scheme proves adequate for the interpretation of all facts i.e. the interpretation of physical facts and moral resolution. Whitehead has included the notion of degrees of importance as an assumption rather than as a supposition.[6] It becomes a justification for constructing the notion of the actual entity from the paradigm of aesthetic experience. Only on that basis can we say that there is a 'logical harmony of being'.[7] Christian is stressing that Whitehead is going further than simply

1. (Dorothy Emmet, 1961, p78)
2. PR 7, 72, 268, SMW ix, 103, and MT 86
3. William A Christian, Some Uses of Reason, In: The Relevance of Whitehead, Ed. Ivor Leclerc, George Allen and Unwin Ltd, London, Ther Macmillan Company New York, 1961, p83) 4.PR p22,
5. William A Christian, Some Uses of Reason, In: The Relevance of Whitehead, Ed. Ivor Leclerc, George Allen and Unwin Ltd, London, Ther Macmillan Company New York, 1961, p83)
6. William A Christian, Some Uses of Reason, In: The Relevance of Whitehead, Ed. Ivor Leclerc, George Allen and Unwin Ltd, London, Ther Macmillan Company New York, 1961, p84) 7.SMW p39.

asserting that from the interconnectedness of things there is a harmony. He is asserting a 'harmony of harmonies'.[1]

Furthermore, according to Christian, we should be conscious of the difference between the use of aesthetic experience to construct a paradigmatic scheme, and its use to defend the 'truth claims' of the scheme. The second use of aesthetic experience is what leads to a questioning of the adequacy of the scheme based on 'feeling' to interpret all the facts. Should we really expect such a paradigmatic scheme to be able to answer questions of both physical motion and moral resolution? An attempt to allow for this difficulty may be recognised in Whitehead's inclusion of a scale or hierarchy of the different importance of things.[2] According to Christian, Whitehead made it clear that hierarchy applies to the nature of things,[3] and that such a harmony could be used to justify both the categorical scheme and the concept of the actual entity. If there is a logical harmony of being, then the intellectual unification of experience would become a unity of aesthetic experiences.[4]

We can trace the scale or hierarchy in the importance of things which Christian speaks of to the 'Principle of Graduated Intensive Relevance' of things. This principle relates eternal objects to the primary physical data of experience. It claims to express a real fact in regard to the preferential adoption of chosen eternal objects to novel occasions as they originate from within a particular environment. The principle is employed in Whitehead's description of the search for a non-statistical explanation of 'probability'.[5] As well as eternal objects the principle involves appetition and the lure of feeling in the primordial nature of God. It also justifies intuition.[6]

Whitehead proposes a direct explanation of the way in which, through the non-statistical judgement of probability involving the principle of the 'graduated intensive relevance of eternal objects', there can be an intuition of the particular suitability of a

1.AI p267, 2.PR p22, 3. PR 167 & 189,
4. William A Christian, Some Uses of Reason, In: The Relevance of Whitehead, Ed. Ivor Leclerc, George Allen and Unwin Ltd, London, Ther Macmillan Company New York, 1961, p85)
5.(The relevance of Probability to Induction was considered in Chapter I Section 2)
6. PR p207.

definite outcome from a given situation. This intuition depends upon the fundamental graduation of appetites which lie at the base of things i.e. the process of concrescence. Describing the process by which eternal objects , as pure potential, are lured into a particular concrescence with prehensions of actual entities in the formation of a new actual entity, provides the explanation and understanding of the way in which the selection of a particular possibility can be made, from all the possibilities which relate to that situation.[1] Such a process at the micro level, because of the nature of organological mechanism, also explains at the macro level the reason why it is justifiable to rely upon an intuition of probability in respect of a novel experiential situation. In this instance 'intuition' is 'feeling'. Not only does this offer a unique explanation of a recognised phenomenon in the macro world of actual occasions through an inherent ability to make judgements, but it also claims a fundamental link between the macro world of 'sense objects' and the micro world of the process of actual entities through concrescence.[2] This is something of importance in a philosophy of this kind, which is attempting to link the eternal and the temporal in its description of apparent reality.

These considerations of Whitehead's employment of the word 'feeling' for positive prehension have concentrated upon attempts to explain and understand the selection of that word. The suggestion of McGilvary, recorded in the previous section, that Whitehead simply created the mode of presentational immediacy in order to accommodate what is essentially 'an ad-hoc aspect of his scheme', is difficult to justify in the face of the evidence offered. Whitehead's doctrine of perception is clearly a development of aspects of the Leibnizian notions and as such demonstrates structure and coherence, but for McGilvary then to suggest that Whitehead simply created a category of perception to justify his rejection of the doctrine of simple location, appears to put the cart before the horse. Lewis Ford is one among many who have demonstrated the growth and development of Whitehead's whole philosophical scheme of organism, the evidence from which is that its coherent and logical development was Whitehead's prime concern. The development demonstrates the internal growth of the scheme rather than it being a series of theories doctrines and notions hung loosely

1.PR p207, 2.PR p207.

together. Rather than describing prehension or 'feeling' as 'ad-hoc' it would be more accurate to follow William A Christian and describe it as part of the central platform of the whole philosophy.

McGilvary's challenge to Whitehead's organological scheme appears to rely on the traditional sensationalist doctrines of the empiricist philosophers which Whitehead has already rejected in the course of the development of his philosophy of organism. Whitehead could not have accepted the validity of McGilvary's criticisms unless he had, in the 'looking around', come across a suitable substitute in the philosophy of Leibniz. with its 'spirituality'.

2 The Actual Entity

At the close the presentation of Pinar Canevi's paper on the 'Actual Entity',[1] an attempt was made to draw some conclusions from the issues he had raised. However, his claim that the introduction of the actual entity had failed to fulfil the first test of philosophy, which he described as the elucidation of ordinary experience, requires special attention. A corollary was quickly added by Canevi, that the actual entity transcends the experience of Laboratory Physics.[2] These issues emanated from the of finding a solution to the deeper problem of accommodating 'being' and 'becoming' to one-another. This judgement upon Whitehead's philosophy is not implying that Whitehead defaulted on these issues by neglect, for 'becoming' and 'process' are at the heart of his philosophy of organism.

In this thesis there has already been discussion on Whitehead's decision to change the title of the basic unit of recurrence in nature, from event to entity, which revealed the close involvement of the need to confine development and choice to the process of concrescence itself, thereby providing the stability of the atomic cell of the actual entity as an explanation of the character of the actual world.[3] Canevi's observations highlight

1.(See Section 10, Sides 10 -11)
2. Pinar Canevi, Do we need the "Actual Entities"? In: Whitehead and the Idea of Process, First International Whitehead Symposium, 1981, Ed.: Harold Holz und Ernest Wolf-Gazo, p185,
3. (See Section Side)

the lack of consensus in answers offered to the contentious problem, as to what exactly constitutes the place of process in the created order, and therefore what is real. Whitehead has questioned whether we are being asked to confine ourselves to mere appearances as representing what is truly real?

According to Arthur E Murphy, Whitehead's commitment to the principle of process as part of apparent reality and the fundamental doctrine: "That **how** an actual entity **becomes** constitutes **what** the actual entity **is**,..."[1] demonstrates the central position of the question of what is real, in his philosophy. Yet Murphy noted that Whitehead's response was directly opposed by F. H. Bradley, in his 'Appearance and Reality' in which Bradley insists that 'real' cannot be in the process of becoming. Murphy questions how anyone can possibly choose between these two great opposites.[2] However, he also notes that Samuel Alexander believed that every level of existence, however complex, was ultimately reducible to the basic reality of things in pure space-time. Thus, according to McGilvary, Alexander is stating that the task of settling what is finally real, depends upon what satisfies the mind and is intelligible.[3]

Canevi's suggestion that Whitehead had not remembered the first principle of philosophy in failing to elucidate ordinary experience, must be in part a suggestion that Whitehead's efforts were a failure, for Whitehead devoted much time and space to providing answers to this question. His description of the way in which the planet Pluto was discovered is enthusiastic in its revelation of 'true' scientific method. In it he raises the question of the role of instruments and technology:

> "We have only got to look in the sky, towards Percy Lowell's moving point, and we shall see a new planet. Certainly we shall not. All that any person has seen is a few faint dots on photographic plates, involving the intervention of photography, excellent telescopes, elaborate apparatus, long exposures and favourable nights."[4]

Whitehead explains this as the speculative extension of an innumerable amount of laws of physics concerning everything that was involved in the observation. From this the totality of the observed facts are registered, through the speculative application of known laws to that particular set of circumstances. According to Whitehead, what is required, over and above the positivist description of the event, is a desire to explain

1.PR p23, 2.(Schilpp, 1951, p362) 3.(Schilpp, 1951, p362) 4.AI p127.

the description.[1] But it is the various attempts to interpret and explain that demonstrate the fact that the certainties of science are a delusion. They are limited by the metaphysical concepts of their own particular epochs.[2] Yet for science to progress we still require the observational detail garnered by whatever means. How better can this be illustrated than through the comparison of the 'Milky Way' as described by general appearance as: "...the faintly luminous stretch of the sky...", to be contrasted with a more 'scientific' description as a: "... flux of light energy travelling through the utmost depths of space ...,"[3] The truth-relationship here is between the past and our present experience, based upon a belief in the stability in the types of order involved. The message is that in the truth of our present immediacy there may be an element of the limitations of our own perceptions.[4] According to Whitehead, we must continue to distinguish between truth and appearance. Reality is whatever it is, but truth confirms appearance as reality.[5]

Canevi's observation is even more startling in view of the fact that he writes as a philosopher of science. How can the experience of a laboratory physicist ever be set in comparison with appearance of reality from the perspective of one, whom Newton described as the 'Vulgar'?[6] Laboratory science has progressed from direct observation of events, to the need to include speculation regarding the effects of events such as particles in cloud chambers or the darkening of photographic film as a result of a form of radiative energy, to the postulating of theoretical particles such as 'gluons' and 'gravitons' to account for unseen but experienced or measured forces. According to one source, in visualising the atom: "Schrodinger even began to doubt the **existence** of particles."[7]

When Democritus conceived the notion of an atom as the building block of all things,

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1.AI p128, 2. AI p154,
3. AI 247. Whitehead's first aim with this account was to illustrate the distinction in what he describes as a type of truth-relation. The reality is a function of the past perceived in the present. This represents a distance barrier between our own galaxy and the remainder of the universe. We are not even aware as to whether the activity which produced the light is continuing, or even whether the intervening space has 'changed the ordering of their goings-on.' p247.
4.AI p248, 5.AI p241, 6. PR p72,
7. J. P. McEvoy and Zarate, Quantum Theory for Beginners, Icon Books Ltd., 1996,

it was to him a completely theoretical particle, since when its isolation and description has revealed it to be divisible, with all that this implies regarding a fundamental particle at the base of everything. The quest to find yet smaller and smaller particles at the sub-atomic level continues in the construction of such 'Superconducting, Super Colliders', described as so important by Stephen Weinberg.[1] Whether those behind these efforts to discover the smaller accept that there is an infinite regress in nature, or that ultimately the smallest particle will be discovered, is not altogether clear, but recent attempts to give experimental support to a Grand Unification Theory, which relates all the forces of nature in one complete scheme of everything, have met with only limited success. Whether the 'rational man', referred to by Canevi,[2] is only rational if he believes in the reported experiences of the physicist in the laboratory, and whether he is able to relate his own experiences of the world to that same information from the laboratory are both serious questions. If to be 'real' is more than simply appearance, and a consensus cannot be achieved on the means by which the 'real' is established as 'real', then Canevi's reasons for challenging Whitehead's thesis, based upon the actual entity, will have to be strengthened.

The actual entity and its internal activity is the base from which 'nexus' and 'societies' are derived. Collectively, these constitute the structure of Whitehead's entire organological scheme. The internal activity of the actual entity is the substantial activity which Whitehead refers to as being 'at the base of things.[3] According to Victor Lowe, it is upon the basis of this activity and the ensuing structures that Whitehead is able to develop his explanation as to how an evolutionary biology accounts for the rise of organisms. This then leads on to explanations in the philosophy of organism concerning endurance and change.[4] Thus to challenge the need for the actual entity is to question the entire structure of the scheme that has been built upon it. Whitehead describes the ultimate notion of the greatest generality which

1. Stephen Weinberg, Dreams of a Final Theory, Hutchinson, 1993, pp210-220.
2. Pinar Canevi, Do we need the "Actual Entities"? In: Whitehead and the Idea of Process, First International Whitehead Symposium, 1981, Ed.: Harold Holz und Ernest Wolf-Gazo, p185, 3.PR p31,
4., Victor Lowe, The Approach to Metapysics, In: The Relevance of Whitehead, Muirhead Library of Philosophy, Ed. Ivor Leclerc, Series Editor, H D Lewis, George Allen & Unwin Ltd. 1961, p229.

is at the base of things, 'creativity', as being one of the formative elements in the concrescence of actual entities. It is to these three formative elements that we now return.

3 The Formative elements

In his philosophy of organism Whitehead faced the same metaphysical questions as those faced by all who attempt to account for the existence of the world of experience, for experience is the relationship between the world of temporality and the eternal. This includes wrestling with the problems of permanence and flux, as did Plato. Whitehead made a distinction between the timeless, which largely represents the eternal, and the changing and passing elements of the world, which represent the temporal and finite. The solution offered by Whitehead has led some to describe Whitehead's philosophy as Platonic.

Whitehead regarded Plato's cosmological scheme as in many ways superior to that of Newton, even though Plato's knowledge of the world was considerably less than Newton's, because Plato constructed a more complete cosmological scheme through the inclusion of metaphysics. According to Whitehead, Newton chose to keep the deity on the sidelines, because, as Newton admitted, he had kept his audience's particular theistic view of the deity in mind. This allowed Newton to make certain assumptions concerning nature as given and to remove from his explanations questions concerning the deity.[1] This may have assisted the absorption of Newton's cosmological scheme into all branches of science, but the omission is unacceptable to the philosophy of organism, in which it is essential that the cosmological questions which relate to the eternal, omitted by Newton, are included. According to Whitehead, the aim of this philosophy is to relate the doctrine of causation to states of things within the actual world. To fail to challenge them by placing them on the shoulders of a transcendent deity[2] and reduce biology to a mystery, is regarded as illegitimate.[3]

Whitehead's premise was that anything which we may describe as 'temporal' is the result of participation in things which we describe as 'eternal', for one arises from the

1.PR p93, 2.PR p93, 3.PR p94.

other.[1] He recognised the difficulty of the metaphysician, who has to describe not only the existence of actual things which have their own characteristics, but also how these things gain their characteristics. This demands the inclusion in the scheme of some form of potentiality: "If the term 'eternal objects' is disliked, the term 'potentials' would be suitable."[2] For Whitehead it is true of any system claiming that every form of definiteness involves the eternal, that it will include a description of fundamental things and their characteristics in the philosophical description of the system. Hence the philosophy of organism must show how each entity will have some degree of relevance to whatever is happening, whenever it happens. However, what is relevant but has no guarantee of being realised, is still relevant through its potentiality. This principle struck a cord with Victor Lowe who stated that "... a metaphysics which does not boldly make a generous allowance for forms of existence 'beyond our present imaginations', is in danger of a dogmatic provincialism."[3]

According to Whitehead, metaphysicians refusing to recognise this need are making an abstraction from the reality of the actual world and the continuation of time, as though the world were in some way static:

> "The vicious separation of the flux from the permanence leads to the concept of an entirely static God, with eminent reality, in relation to an entirely fluent world, with deficient reality. But if the opposites, static and fluent, have once been so explained as separately to characterise divers actualities, the interplay between the thing which is static and the things which are fluent involves contradiction at every step in its explanation."[4]

Only in such a static world could it be stated that the world's existence is composed of actual things and that is all. Whitehead emphasises that this is not our universe, for that reveals new actualities from potentialities every day, a notion which can be developed whether efficient or final causes, or both, are stressed. Hence Lowe highlights Whitehead's conclusion is that there must be some allowance for the notion of potentiality. Whitehead dealt with this difficulty by introducing his form of definiteness as pure potential, each one being for eternity, a potential for any purpose.[5] Hence, the role of eternal objects is as pure potential in imparting eternal value into

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1.PR p40. 2.PR p149,
3. Victor Lowe, The Approach to Metapysics, In: The Relevance of Whitehead, Muirhead Library of Philosophy, Ed. Ivor Leclerc, Series Editor, H D Lewis, George Allen & Unwin Ltd. 1961, p193. 4.PR p346, 5.PR p149. (See also PR p44)

Whitehead associated his cosmology with that of Plato when he stated that: "The safest general characterisation of the European philosophical tradition is that it consists of a series of footnotes to Plato."[1] However, although both Whitehead and Plato accepted the need to appeal to the eternal in their metaphysics, Whitehead's explanation is sufficiently distinctive from that of Plato's to be regarded as different. Unlike Plato, who described the world we experience within creation participating in the 'forms', which are the eternal enduring realities but which are always other than this temporal creation itself, Whitehead brings the presence of the eternal directly into the realm of the temporal and insists that the two are inextricably linked. Hence, Whitehead has the task of equating a duality of roles, one of the eternal objects as the possibility for actualisation as pure potential, and the other described in the process of concrescence as part of the determinate of the new actual entity. This process is subservient to the subjective aim which is derived from God. Thus, the relationship between the eternal, in the form of eternal objects, and God, as the primordial entity, has to be established.

A consequence of giving eternal objects the role of pure potentiality was the need to introduce a limit to realisation which would determine which eternal objects would be actualised and which not. This required a role for something acting in the world and this could only be attributed to God i.e. God became the principle of limitation.[2] Although initially this appears to have been the only role for the primordial nature of God, later on God also became the locus of the unrealised eternal objects, so that all derivative powers rested in actual entities. This constituted the introduction of the ontological principle. Prof. Emmet regarded the ontological principle as the centre of the problem of eternal objects.[3]

Prof. Emmet offers her own alternative doctrine in order to overcome the difficulties in stating that the eternal objects should be regarded as components of the nature of God, and as such they would be the equivalent of the Platonic world of ideas. Potentiality

1.PR p39, 2.PR p42/3, 3.(Emmet, 1966, Pref. xx, and p118)

would then be the opening up of new permutations of combinations of the infinite variety of forms, primordially envisaged in God. However, the question remains as to whether such an interpretation can be abstracted from Whitehead's own descriptions which also imply that: "...all the aesthetic beauty, the art, friendships, humour, unexpectedness and remorselessness experienced in the process of the temporal world are simply exemplifications of 'forms of definiteness' primordially envisaged."[1]

Donald Sherburne argues against the description of Whitehead's scheme as Platonic, on the basis of God's direct involvement in the affairs of the world.[2] Applying the ontological principle that everything must be somewhere, which ultimately means reference to some actual entity, raises the difficulty of satisfactorily incorporating the eternal objects into the coherence of Whitehead's scheme, for they are described as the general potentiality of the universe and for them this 'somewhere' is the non-temporal actual entity. This is described by Whitehead as a 'proximate' relevance and is found in the complete potentiality of the eternal objects residing in the primordial nature of God.[3]

The introduction of the primordial nature regarding limitation and lure of conceptual feeling in concrescence of the actual entity, leaves unanswered Prof. Emmet's question as to whether there is in effect a finite number of eternal objects which may be rotated in various permutations through the influence of the primordial nature in the process of concrescence. Her suggestion that the eternal objects should be components of the nature of God would be an opportunity for creating new and varied permutations of the infinite variety of forms derived from these combinations. But she recognises that if this was to be the single role of the eternal object, the spontaneous opportunity for novelty would still appear to be lost. None of these explanations or suggestions appear to make it possible to achieve Whitehead's final goal for the process of concrescence to be self-creating towards novelty.[4]

Lewis Ford referred to God's role as the principle of limitation in Whitehead's scheme

1. (Emmet, 1966, pp119/120) 2. (Donald W Sherburne, 1966, p222) 3.PR p46, 4. (Emmet, 1961, p118)

However, Prof. Emmet herself suggested that this interpretation of the philosophy could be a misunderstanding and that other interpretations are possible and by implication desirable.

as a 'pan-subjectivity', in which every occasion has its own interiority through which it is influenced by 'transcendent eternal objects'. These are what contribute to its possibilities. Lewis Ford believes that this change in Whitehead's thinking was so radical that it only appeared in his scheme several years later.[1]

Whitehead's aim in making these changes in the role of eternal objects was to retain true novelty as an essential characteristic of the process of concrescence. Eternal objects as the datum of conceptual feelings would assist in the explanation of the apparent opportunity for newness, development, change and human agency which are all recognised in the temporal world. However, Lewis Ford's account of the way in which Whitehead changed the description of the role of eternal objects does not seem to solve the problem of pure potential, for to be lured into a concreting actual entity is to become part of the datum of the actual entity.[2] In this role eternal objects are still under the control of the primordial nature of God as the limitation in the process of concrescence through the subjective aim. The new question is, if it is not the primordial nature of God which influences and limits the take up of eternal objects,

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1. Lewis Ford, 'From Transition to Concrescence', In: Whitehead and the Idea of Process, Poceedings of the first International Whitehead Symposium, Ed. Harold Holz and Ernest Wolf-Gazo, 1981, p76. 2.PR p44.
According to Lewis Ford, knowledge of the developmental nature of the philosophical scheme is of considerable advantage in recognising changes made by Whitehead to roles and doctrine. Such changes could take place within the span of a book and not simply between lectures or publications. One of the major groups of changes were those concerning the nature of concrescence. The notion developed out of Whitehead's doctrine of 'transition' which simply meant 'transition from event to event', to the full and final meaning of 'the self-creation of the universe'. According to Ford, Whitehead achieved these changes to concrescence by generalising Hume's 'missing shade of blue' discussion in terms of the principle of reversion so that alternatives could be given to every possibility. This legitimises the use of the principle of conceptual derivation, in which eternal objects can be regarded as derivable by abstraction from prehended actual entities. It also means that derivation and reversion act together to enable true novelty to be part of the scheme. (p98)

Ford suggests that such radical changes have to be taken into account if the different phases of the development are to be correctly placed in their correct true context. For example in Science and the Modern World there are no references to 'actual occasions' or 'Epochal time' and most significantly for this discussion, eternal objects have only an immanent role as the characteristics of an event. Although we never see a change in the description of an eternal object its role does change significantly.(p75) We first observe eternal objects taking on a role in their own right through their lure for possibilities to realisation.(p76)

what other entity would it be that could fulfil that role? Simply to state that there is now a 'pan-subjectivity' and an 'interiority', which happens to satisfy the ontological principle, in so far as all derivative power is rested in the actual entities, is not enough to delineate the roles of the potentiality of eternal objects and the subjective aim. It still appears to leave the subjective aim influenced by the primordial nature of God, which is therefore still in control. This demands a reassessment of the role of God in concrescence.

We see this same doctrine, of the independence of the temporal actual entity and the eternal object in the process of concrescence, theoretically also applied in the case of the primordial nature of God, for it is not directly involved in any particular course of history even though it is the source of the eternal objects.[1] Whitehead has made it clear that all metaphysical principles will apply to God also. In fact, Whitehead went further when he stated that not only should God not be regarded as an exception to any rule, introduced when appropriate in order to save the metaphysical principles, but also that God is their chief exemplification.[2]

God is by definition the primordial actual entity in which there is no past. The difference between the Primordial Nature and other actual entities is that the derivative aspect of conceptual feeling does not apply, though it still has a threefold character as does the actual entity. First, the Primordial Nature is the unity of all conceptual feelings, including eternal objects, such that it directs the aim in the process of concrescence, thereby directing the subjective forms of the feeling into lures for

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According to Dorothy Emmet, it was through the introduction of the notion of the ingression of eternal objects into the concrescence of the actual entity, that Whitehead began to deal with the question of how process can demonstrate permanence. However, this question of 'ingression' and 'objects' only leads her to question Whitehead's use of words. She believed Whitehead continually attempted to avoid language which would introduce associated ambiguities or additional meanings. (Dorothy Emmet, 1966, p39/40)

"Whitehead extends the principle to claim that the modern philosopher has the right to coin new words when he wishes to express a new idea, since he holds that the use of many philosophical terms are now misleading in their associations." P39

Lewis Ford, 'From Transition to Concrescence', In: Whitehead and the Idea of Process, Poceedings of the first International Whitehead Symposium, Ed. Harold Holz and Ernest Wolf-Gazo, 1981, p76.

1. PR p44, 2. PR p343.

feeling.[1] Second, the Consequent Nature is God's involvement in the consequent world, through physical prehensions in the actualities of the evolving universe. Thirdly, God also has a superjective nature, which is the working value of the specific satisfaction of God. This qualifies the transcendent creativity in different temporal instances of the creative process.[2]

An alternative doctrine, according to Victor Lowe, is to say that God, as the primordially created fact, is the unconditioned conceptual valuation of the totality of all types of eternal object, which is at the base of things.[3] This introduces an order in the relevance of eternal objects in respect of the entire process of creation,[4] and apart from God there can be no relevant novelty, for it is through god as that actual entity, that eternal objects attain their graduated relevance at the different stages of concrescence.[5] The unity of conceptual operations in God is 'a free creative act' unrestricted by the course of anything else, and not deflected by any emotion or anything that can happen. The details of the actual world presuppose it, while God in this mode simply presupposes the general metaphysical character of the creative advance, of which god is the primordial example. Thus: "The primordial nature of God is the acquirement by creativity of a primordial character" and: "...the lure for feeling, the eternal urge of desire."[6]

However, this description highlights a new concern, that of the emphasis being placed on a significant role in creation for the primordial nature of God, as the first non-temporal actual entity. The new forms of definiteness are apparently already envisaged in the nature of God, for Whitehead describes God as 'the principle of concretion', which means the process of realisation[7] with the resultant involvement of a new determining force in relation to the description of the role of the eternal objects. Lowe suggests that the new question is whether the process of creativity into novelty is simply a matter of a choice between what are essentially already established possibilities of newness in the primordial nature, acting through the subjective form, or whether there can be a truly spontaneous novelty in the concrescence itself, through

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1.PR 87, 2.PR p88, 3.PR p31, 4.PR p344. 5.PR p163,
6.Victor Lowe, The Approach to Metaphysics, In: The Relevance of Whitehead, (Ed. Ivor LeClerk) p213.
7. SMW p216.

the concreting process from one actual entity to the next. This would be achieved through the selection of the eternal objects relevant and related to that particular concrescence.[1] This is essentially the same difficulty considered by Prof. Emmet, concerning the retention of freedom and novelty in concrescence.

This linking of God with creativity through novelty, leads Prof. Jan Van de Veken to question whether, ultimately, it is possible to decide upon Whitehead's intentions for the interpretation of the roles of each of his formative elements. For example, Whitehead appears to demonstrate two distinct meanings for the word 'God',[2] hence, the meaning of Van de Veken's title for his paper: "Whitehead's God is not Whiteheadian Enough". This title is based on the fact that Whitehead's notion of God is not consistent between sets of metaphysical and religious categories. In this sense it is not coherent and thus not Whiteheadian.[3]

A 'religious' interpretation has been recognised by Charles Hartshorne, in which the role of God in relation to 'Creativity' has been enhanced and God has become the supreme example of creativity rather than its first qualification.[4] Thus, by linking God's role to creation through concrescence Whitehead has introduced other considerations of a religious nature.[5] A second interpretation is that demonstrated by Donald W Sherburne, in which, according to Van de Veken, God, as the first non-temporal actual entity among other actual entities, performs tasks other actual entities cannot do. God is in unity with all other actual entities in their becoming, although no actual entity can prehend another contemporary actual entity, only actual entities of the antecedent world.[6] This suggestion in this interpretation is that Whitehead's notion of

1. Victor Lowe, The Approach to Metaphysics, In: The Relevance of Whitehead, (Ed. Ivor LeClerk) p213.
2.Jan Van de Veken, Whitehead's God is not Whiteheadian Enough, First International Whitehead-Symposium, 1981, Ed Harold Holz and Ernst Wolf-Gazo, p301/2,
3.Jan Van de Veken, Whitehead's God is not Whiteheadian Enough, First International Whitehead-Symposium, 1981, Ed Harold Holz and Ernst Wolf-Gazo, p301,
4.Jan Van de Veken, Whitehead's God is not Whiteheadian Enough, First International Whitehead-Symposium, 1981, Ed Harold Holz and Ernst Wolf-Gazo, p302,
5.Jan Van de Veken, Whitehead's God is not Whiteheadian Enough, First International Whitehead-Symposium, 1981, Ed Harold Holz and Ernst Wolf-Gazo, p301,
6.Jan Van de Veken, Whitehead's God is not Whiteheadian Enough, First International Whitehead-Symposium, 1981, Ed Harold Holz and Ernst Wolf-Gazo, p303.

God is based purely on metaphysics and this produces a God of no religious value.[1] Van de Veken interprets Sherburne's position as suggesting that 'creativity' is adequate to provide a rational account of the process by which an immediately past occasion provides for the presently emerging occasion which are contiguous to it. Whitehead's metaphysical ultimate is creativity itself, limited or qualified, possibly, by the primordial nature of God.[2]

Van de Veken believes, that Whitehead has clarified his intention in his metaphysics to employ the meticulous method of science, in order to discover the general ideas which are essential in the analysis of 'everything that happens',[3] but he believes that the result of this is that it makes Whitehead's God insufficiently 'transcendent'. This only illustrates the important fact that Whitehead is not writing for theists, but rather to do justice to the metaphysical concepts required by the whole scheme. He attributes this to the result of Whitehead's God being the consequence of metaphysics, and not theology, which he believes has resulted from an attempt to combine ambiguities. This description of the role of God as a metaphysical necessity rather than a theological creation, establishes God as the basis of order and the incentive for novelty. These are the instruments of the subjective aim, which is described as the intensification of formal immediacy. In so far as God is involved in everything that follows, the process of concrescence becomes its own reason in respect of the selection of the various qualities of feelings. It has the final responsibility as to which lure for feeling comes into operation. This element, as part of self causation, becomes the explanation of the freedom which is inherent in the universe.[4] Envisaging the nature of the deity as di-polar enables the primordial nature to be the first example of the metaphysical principle of the entire scheme, rather than something which is posited to support the scheme as is usually the case in traditional theological explanations of creation.[5] Thus, according to Van de Veken, God in the Whiteheadian system is entirely the product of the metaphysical system and as such is the essential part of it which enables the system to retain its coherence.[6]

1.Jan Van de Veken, Whitehead's God is not Whiteheadian Enough, First International Whitehead-Symposium, 1981, Ed Harold Holz and Ernst Wolf-Gazo, p300,
2.Jan Van de Veken, Whitehead's God is not Whiteheadian Enough, First International Whitehead-Symposium, 1981, Ed Harold Holz and Ernst Wolf-Gazo, p303,
3.MT p82, 4. PR p88, 5.PR p242/3.

Lewis Ford demonstrates less concern for theists when, in recognising Whitehead's need to introduce a concept of 'limitation' in order to determine which eternal objects would be actualised in a particular concrescence, he gave the role to God. Not only was this role not as transcendent creator, but Ford believes that if such a role could not have been found, Whitehead would have been bound to reject the existence of God altogether. The implication here is that the use of the term 'God' is arbitrary, as it simply fulfils a necessary role in the process of concrescence within the total scheme.[1]

Ascribing actuality to one aspect of the deity, the primordial nature, which is the first among equals but without consciousness or completion, the bases of creativity and all that this entails, including the direction of eternal objects in the course of the process of creativity, has proved a stumbling block for many commentators. Prof. Emmet is in agreement with Whitehead that unfettered creativity and unbounded potentiality alone could produce nothing.[2] If we recognise that by its very nature potentiality offers more than what becomes 'actuality', i.e. potentiality is greater than actuality, then there has to be some form of enabling for the potentiality to become actuality, or put the other way, there has to be some limitation upon what actually becomes. Thus, in the same process there must be provision for a 'limitation' which, according to the Ontological Principle is based upon the limitations of God as the first, non temporal actual entity. According to Emmet, it is this first limitation which establishes the criteria imposed on the whole process of becoming, which involves the 'satisfaction' of the actual entity and objective immortality.[3]

However, Prof. Emmet questions whether such a rationalistic philosophy as that of Whitehead's must inevitably do violence to religious intuitions, or whether for the

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6.Jan Van de Veken, Whitehead's God is not Whiteheadian Enough, First International Whitehead-Symposium, 1981, Ed Harold Holz and Ernst Wolf-Gazo, p309/10,
1.Lewis Ford, The Concept of 'Process': From 'Transition' to 'Concrescence', First International Whitehead-Symposium,1981, Ed. Harold Holz and Ernst Wolf-Gazo, 76.
2.Emmet refers to Whitehead following Leibniz and his 'Principle of Sufficient Reason' when he argued that to say that the realm of possibility is wider than that of actuality it becomes necessary to affirm that there must be a primordial limitation of pure creativity. It is in this sense that God is said to be the 'Principle of Concretion' on what becomes and can become.
3.(Prof. Dorothy Emmet, 1966, p199-200).

theist his use of the Primordial Nature in this role, is not scandalous, for it identifies God with Whitehead's description of 'creativity'.[1] At the very least this trepidation highlights the important fact that metaphysics and religion are not the same. The Primordial Nature as described by Whitehead, suggests that it is an accident of creativity, by which Prof. Emmet interprets Whitehead as meaning that we cannot give a reason for the nature of creativity itself, or why the role of God is as it is. However, it can tell us that there is a particular course of events because there is some primordial limitation upon creativity, which according to Whitehead is God's Primordial Nature.[2]

The general conclusion has been that through his doctrines relating to the Formative Elements, Whitehead has dispensed with the burden of traditional theistic dogma but at the same time retained the notion of God. It demonstrates the integrity Whitehead employed in the construction of his scheme and his willingness to construct it in the light of what is required, rather than as something which must attempt to fit into preconceived notions. This willingness is further exemplified by the notion of the Consequent Nature of God. The central idea of the cosmological scheme of the philosophy of organism is to produce a coherent system.[3] It continues to do this by attributing to God two aspects, the first of which, the Primordial Nature, embodies a basic completeness of appetition, and the second, relating to the Consequent nature, is the result of every occasion producing a concrescence of the universe, contributing to God.[4]

Transmutation and Perception

In outlining the three main difficulties he experienced with Whitehead's doctrine of 'Transmutation', James S Felt noted that Whitehead had to face the same difficulty in his philosophy of organism that Leibniz had faced in his 'monadology'. For the Libnizian doctrine of 'confusion' Whitehead had substituted his own doctrine of

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1.(Prof. Dorothy Emmet, 1966, p246) 2.(Prof. Dorothy Emmet, 1966, p249)
Prof. Emmet in a later comment refers to the difficulties which she has with Whitehead's notion that the Primordial Nature of God is an actual entity, even as the foremost one among equals. Since creativity is not prior to its creatures, primordial should be taken as an ordering which underlies all other order.
Prof. Dorothy Emmet, 'Creativity and the Passage of Nature', In: Whitehead's Metaphysik of Kreativitat, International Whitehead Symposium, Bad Homburg, 1983. Ed. Friedrich Rapp und Reiner Wiehl. 3.PR p128, 4.PR p316.

'transmutation'. We have since also noted that Whitehead recognised that the difficulty facing Leibniz is one which faces all metaphysical philosophers.[1] On the assumption that Whitehead has adopted Leibnizian spirituality, for the reason that he is not satisfied with the results of Leibniz' efforts, should we be surprised that Whitehead's answer is no more acceptable than was that of Leibniz to Felt. The general conclusion to Felt's detailed analysis of the doctrine was that Whitehead had relapsed into: "... some kind of naïve realism".[1]

Felt asked the question as to how we see an elephant when we do see one.[2] He described Whitehead's attempt at an explanation, through the doctrine of transmutation, as 'illusory'.[3] Having analysed Whitehead's description, Felt concluded that there is no way in which the visual experience of a grey object such as an elephant, can be accounted for as a result of that description. Felt also encountered a repetition in Whitehead's account, through the transmutation of grey as an ingredient in the conceptual feeling of the entities which constitute the nexus of the elephant's hide, as well as it also being prehended by the perceiver.[4]

Felt's attempt to establish the nature of the elephant as grey, is to suggest that grey is neither only in the elephant nor simply in the eye of the one 'seeing' the elephant, for colour is neither a simple 'objective ingredient' nor is it a phantasy in the beholder, for whatever reason. According to Felt: "It is rather a characteristic of the object precisely and only in its relationship to the seer within the very act of seeing."[5] Felt appears to

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1.PR p27.

1. James W. Felt S. J., Transmutation and Whitehead's Elephant, In: Whitehead and the Idea of Process, Proceedings of the first international Whitehead Symposium, Ed. Harold Holz and Ernest Wolf-Gazo,1981, p182.
2. James W. Felt S. J., Transmutation and Whitehead's Elephant, In: Whitehead and the Idea of Process, Proceedings of the first international Whitehead Symposium, Ed. Harold Holz and Ernest Wolf-Gazo,1981, p179/80.
3. James W. Felt S. J., Transmutation and Whitehead's Elephant, In: Whitehead and the Idea of Process, Proceedings of the first international Whitehead Symposium, Ed. Harold Holz and Ernest Wolf-Gazo,1981, p180.
4. James W. Felt S. J., Transmutation and Whitehead's Elephant, In: Whitehead and the Idea of Process, Proceedings of the first international Whitehead Symposium, Ed. Harold Holz and Ernest Wolf-Gazo,1981, p181.
5. James W. Felt S. J., Transmutation and Whitehead's Elephant, In: Whitehead and the Idea of Process, Proceedings of the first international Whitehead Symposium, Ed. Harold Holz and Ernest Wolf-Gazo,1981, p182.

be differentiating between the elephant as seen, and the elephant as an elephant not seen i.e. alone as an elephant. This description, for it is not an explanation, claims to deny the sensationalist doctrine of empiricists such as Locke and Hume, while also reaching a conclusion which differentiates between an actual world in which there is an elephant, and perception of that world which is essential for the elephant to be perceived as grey: "It is rather a characteristic of the object precisely and only in its relationship to the seer within the very act of seeing."[1] Felt is offering his own 'third way' as an alternative doctrine to that of Galileo and Newton, which was followed by Descartes, Locke and Hume, in the perception of grey as entirely subjective, in which 'grey' is only in 'the eye of the beholder'. The difficulty is in the fine distinction Felt makes between the sensationalist doctrine followed by those mentioned above, and his own compromise of a combination of objectivity and subjectivity. It is Whitehead's 'objectivism' which suggests that the seen grey in the elephant can somehow be in the elephant out there, which is rejected by Felt as 'naïve realism'.[2]

According to Leclerc quoted by Felt, Whitehead's theory of transmutation is linked with his atomistic view of reality. This implies that a body or society is an aggregate, in so far as it is the unity of a society and, according to Leclerc, it is not one single entity. That is to say, it is not adequate as a description of the fundamental building block which is the smallest recurrent element of nature, postulated to avoid the notion of an infinite regress in nature. Felt tells us that Leclerc's alternative is a theory of compound substances and that such a suggestion has found favour with both Edward Pols and Paul Weiss, the latter seeking something 'more believable' than Whitehead's account of 'skeletal societies' being made to account for people. Such a doctrine appears to the to fly in the face of 'common sense'.[3] We will return to the point concerning societies later, after first considering the suggestion that some form of

1. James W. Felt S. J., Transmutation and Whitehead's Elephant, In: Whitehead and the Idea of Process, Proceedings of the first international Whitehead Symposium, Ed. Harold Holz and Ernest Wolf-Gazo,1981, p182.
2. James W. Felt S. J., Transmutation and Whitehead's Elephant, In: Whitehead and the Idea of Process, Proceedings of the first international Whitehead Symposium, Ed. Harold Holz and Ernest Wolf-Gazo,1981, p182.
3. James W. Felt S. J., Transmutation and Whitehead's Elephant, In: Whitehead and the Idea of Process, Proceedings of the first international Whitehead Symposium, Ed. Harold Holz and Ernest Wolf-Gazo,1981, p184.

'compound substances' can be an alternative to Whitehead's doctrine of an atomic cell, for this has similarities to Sellars' suggestion that compounds of varieties of substances may be a superior explanation for 'organic bodies' to that of Whitehead's scheme.

Roy Wood Sellars recognised that his attempt to adapt the sensationalist doctrine of perception to something more suited to modern thinking had not proved popular. He too believed that epistemology was going to be at the heart of the acceptability of the contrasts he had made between his philosophy and that of Whitehead.[1] His modification of the sensationalist doctrine was still based upon the premise of the primacy of matter, a doctrine that Whitehead had already demonstrated to his own satisfaction had been replaced by the notion of energy.[2] But Sellars was correct in stating that, by pursuing the spiritualistic plurality of Leibniz, Whitehead had clearly demonstrated the interplay of epistemology and ontology in his philosophy of organism. According to Sellars', his own failure to direct attention to this in his list of challenges which a reader of PR should expect to encounter on the way through that book, was an error of oversight and a mistake.[3]

There appears to be an attempt by Sellars to accomplish a reinstatement of some form of perceptual doctrine based upon an empirical philosophy, formulated in the wake of the disenchantment with Hume's conclusions developed from the doctrine. Sellars attempts to substitute his own form of 'organism' from the discredited doctrine of materialism, for Whitehead's 'organisms', may more easily be challenged than Felt's concerns about transmutation. Sellars is appealing on the basis of a largely rejected doctrine.[4] However, discredited or 'false' doctrines continue to appear at the centre of the interpretation of data. For example, Stephen Weinberg agrees with Whitehead that some doctrines can remain dominant even after their initial contribution to scientific development has been accomplished:

> "Even after the triumph of Newtonianism, the mechanical tradition continued to flourish in physics. The theories of electric and magnetic fields developed in the

1. (Roy Wood Sellars, Schilpp, 1951, p410) 2.SMW p127/8
3. (Roy Wood Sellars, Schilpp, 1951, p413)
4.The reinstatement of a form of the sensationalist doctrine of Hume was unsuccessfully undertaken by the Logical Positivists of the late Nineteenth and early Twentieth Centuries.

> nineteenth century by Michael Farady and James Clerk Maxwell were couched in a mechanical framework, in terms of tensions within a pervasive physical medium, often called the ether. Nineteenth-century physicists were not behaving foolishly - all physicists need some sort of tentative worldview to make progress, and the mechanical worldview seemed as good a candidate as any. But it survived too long."[1]

According to Weinberg, even after the presentation of Einstein's Theory of Special Relativity in 1905, the notion of protons as material particles was retained alongside a field theory of electro-magetism and gravity in the quantum mechanical theory.[1] But according to Whitehead, not only does the retention of such discredited doctrines become a cause of muddle in scientific thought, it also has serious implications for the establishment and credibility of philosophy of organism. As that philosophy does not presuppose these notions, it is rejected as unintelligible.[2] The introduction of a new perspective on the analysis of the characteristics of nature and their interpretation, such as occur with the philosophy of organism, is placed at a great disadvantage.[3]

Such a recognition is important to Whitehead's case, for he expressed concern at the number of discredited doctrines which managed to linger on at many levels of philosophy. The doctrine of the 'undifferentiated endurance of substances', for example, in which substances with essential distinguishing attributes have what he described as 'accidental adventures',[4] have become the principle for the formulation of cosmological theory. Hence, the notion of 'substances' achieves a degree of permanence as they endure undifferentiated with their attributes in space and time, retaining their self identity and changing only in relation to position, relations and quality. According to Whitehead, acceptance of this doctrine has prevented any recognition of the alternative pluralistic interpretations which have been posited.[5] Sellars was hoping to construct a doctrine of perception based upon a retained materialistic philosophy. Such a doctrine would have to include the passivity of matter and yet account for culture and spirituality. Whitehead could do this through the

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1. Steven Weinberg, Dreams of a Final Theory, The Search for the Fundamental Laws of Nature, Hutchinson Radius, London, 1993, p135.
1. Steven Weinberg, Dreams of a Final Theory, The Search for the Fundamental Laws of Nature, Hutchinson Radius, London, 1993, p136.
2.MT 179/80, 3.MT p180, 4.PR p79, 5.PR p78.

adoption of the one word 'appetition', which can account for Neitzsche's drive to dominance, Freud's description of sexual appetite, Mill's philosophy of Hedonism and even the Christian notion of 'love'.

However, Charles Hartshorne is concerned with the charge of 'naïve realism' made against Whitehead by both Felt and Sellars, as a result of Whitehead's construction of his theory of knowledge, formulated to replace the now discredited sense datum theory of what is 'given' in perception. According to Hartshorne, since Whitehead is neither a 'naïve realist' nor one who holds to the 'sense-datum' theory - both of which have been suggested - nor does he adhere to Russell's identity theory that the sensation is the neural process itself, this only demonstrates that Whitehead's distinctive and carefully elaborated theory is not understood. Whitehead may be a direct presentational realist, but he is not the naïve kind.[1]

According to Hartshorne, it is as a result of Whitehead's teaching regarding the prehensive relation of the experience with its datum i.e. a relationship between the perceiver and the perceived which is not one of identity, that we conclude Whitehead does not accept that our sensory experience is the entire process. The temporal element involved means that the datum is prior and independent of the particular experience in question. This accepts that whatever is given in normal vision, it is not simply the optical process itself.

> "The view that Whitehead holds ..... is that the sensory quality and shape given in a sensation does qualify, first of all, a physical process going on inside our bodies, and only less directly and precisely the extra bodily physical thing. To object that it is not **as** something inside our bodies that we experience that process is to forget that locating a process in public space involves correlating data from more than one sense, or it involves correlating processes actually given but not 'seen' ..... with objects that are seen.[2]

Hartshorne emphasises that the theory being followed regarding the inner bodily datum

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1. Charles Hartshorne, The Relevance of Whitehead, Ed: Ivor Leclerc, Ther Muirhead Library of Philosophy, George Allen & Unwin Ltd. London, 1961, p30.
2. Charles Hartshorne, The Relevance of Whitehead, Ed: Ivor Leclerc, Ther Muirhead Library of Philosophy, George Allen & Unwin Ltd. London, 1961, p31/2.
(This relates to the previous comment by Evander Bradley McGilvary concerning the anticipation of the effects of an oncoming storm affecting the whole body. (See Section Side)

of a visual experience, does not imply that it is the datum that is seen rather than the object which reflects the light, for Hartshorne agrees with Gilbert Ryle when he stated that to see means to acquire information about something as a result of the transmission of the light to the appropriate sensory organ. What the theory does say is that this is an evaluation of an automatic nature of something had or possessed.[1] It is a reading of reliable signs. Hartshorne refers to Whitehead's analogy of reading a book where concentration is upon the meaning of the text rather than the individual words used.[2] Although the 'neural theory' is not generally the current belief, according to Hartshorne, there is no conflict with known fact. Science does not know whether the sensed quality sensations of a seen orange is not a quality of a neural process. Science does not locate qualities. The physical and physiological evidence suggests a compatibility between given patterns and the inner bodily processes, whereas there is no physical or physiological evidence to suggest any correlation between: "...given patterns and any patterns existing outside the body;" On the basis that what is 'given' cannot be contradicted, it appears better to go with the hypothesis that the location of what is given is in the body, not outside it.[3]

Hartshorne believes that Whitehead would agree with current talk of dispensing with mere sense data, for the sense datum theory is factually and semantically suspect. However, according to Hartshorne, few contemporaries have shown any inclination to demonstrate how to do that. He questions why the alternative, which is experiment, as in the case of normal empirical procedure, should not be employed. We must continue to distinguish between the act of experiencing and what is experienced. In this context we consider Whitehead's view, one aspect of which is based on logical analysis and the other on that of locating the datum in space- time. This is a reasonable empirical hypothesis but unfortunately few appear to be discussing it. Rather dogmatism reigns in current epistemology.[4]

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1. Charles Hartshorne, The Relevance of Whitehead, Ed: Ivor Leclerc, Ther Muirhead Library of Philosophy, George Allen & Unwin Ltd. London, 1961, p32.
2.PR p185,
3. Charles Hartshorne, The Relevance of Whitehead, Ed: Ivor Leclerc, Ther Muirhead Library of Philosophy, George Allen & Unwin Ltd. London, 1961, p33.
4. Charles Hartshorne, The Relevance of Whitehead, Ed: Ivor Leclerc, Ther Muirhead Library of Philosophy, George Allen & Unwin Ltd. London, 1961, p34.

Hartshorne links his analysis of Whitehead's neural theory of perception and 'reading the reliable signs' to Whitehead's doctrine of transmutation.[1] That doctrine describes how the actual world is as it is, and also why it is what it is, for it is a doctrine of self-creation. According to Whitehead, in order to understand his description of the mode of operation of the doctrine, it is important to recognise the role of propositions in the process. 'Propositions' have for too long been regarded by logicians simply as judgements of truth or falsehood. Francis C Bradley refers only to judgements, omitting the notion of proposition completely. Whitehead makes his own position clear: "The doctrine here laid down is that, in the realization of propositions, 'judgement' is a very rare component, and so is 'consciousness'."[2] Whitehead appeals to 'imaginative literature', such as Hamlet's speech and literature with a strong religious emotion, to demonstrate that in each case 'judgement' is speedily eclipsed by aesthetic evaluation, though a judgement of truth may be based upon the recognition of value. In terms of the philosophy of organism, it is the 'lure for feeling' which is the final cause in concretion which guides the process towards the satisfaction of the actual entity. This whole process is the result of the 'objective lure' for feeling, discriminating between what is to be included in the concrescence and what excluded. Such a process caters for all the possibilities of the events of the world with their particular outcomes and offers an explanation for other courses of events which did not come to fruition.[3] These other possibilities Whitehead refers to as a 'penumbral

1. Charles Hartshorne, The Relevance of Whitehead, Ed: Ivor Leclerc, Ther Muirhead Library of Philosophy, George Allen & Unwin Ltd. London, 1961, p32.
2. PR p184,
3. Whitehead's reference to 'some imaginative writers' who do not dismiss such ideas finds exemplification in those have adopted a multi-universe theory. Andrei Linde, a Russian Cosmologist has been recognised as the first person to formulate a multi-universe theory developed from a version of Alan Guth's 'Inflationary' model. The notion was based upon the effect of opening a bottle of fizzy drink so that each bubble spilling out over the top of the bottle on the release of the energy retained in the bottle, represented, by analogy, the many universes that could be formed in the release of energy at the creation of the universe we know. This is to assume the so-called 'big-bang' theory of creation.
David Filkin, Stephen Hawking's Universe, BBC Books, 1997, pp224/225
This theory did not meet with universal acclaim but it has been taken up by some writers of astronomy books in order to explain the working out of the indefinite number of other possibilities involved in the selection of one possibility and the rejection of all others.

complex' and these too can influence actual events even though they remain only as possibilities which did not come to fruition.[1] Hence, according to Whitehead, the domination of the logicians' interpretation has obscured the true function of proposition as primarily for the origination of 'feeling' at the unconscious level of the physical. A proposition becomes effective when there is a decision to admit it into a particular concrescence.[2]

Whitehead explained 'novelty' through 'non-conformal propositions', those which are deemed to be false in relation to the actual world, being admitted into the synthesis of fact. This introduces an alternative potentiality. "A novelty has emerged into creation."[3] This results in a scheme of syntheses in which error is the price of progress. In the historic route of an enduring physical object, Whitehead recognises three possibilities for the subjective aim as it dominates the concrescence of an occasion. The first leads to an extreme in undifferentiated endurance but which can still achieve a degree of contrast.[4] This is the explanation for 'vibration' in physical science. It describes the life-histories of inorganic physical objects. The second possibility leads to a drive for the enhancement of particular elements of feeling which culminates in the achievement of a single final end for the physical object. Such physical objects are mainly those we term 'organic' in so far as our present knowledge of the world is concerned. The third possibility leads to a drive for elimination of all dominant feelings in the data. This route leads to the loss of historic individuality and decay. Thus, according to Whitehead: "The primary mode of realisation of a proposition in an actual entity, is not by judgement, but by entertainment. A proposition is entertained when it is admitted into feeling. Horror, relief, purpose, and primarily feelings involving the entertainment of propositions."[5]

Returning to Felt's reference to Paul Weiss and his rejection of Whitehead's 'skeletal societies' as an explanation for the structure of our world, we discover Weiss urging the adoption of the notion of 'natural individuals' or 'complex wholes' as the basis for the 'seat of action' of the philosophical scheme. These would, he believes, be more believable. But Prof. Emmet suggested that it is possible to consider the reproduction

1.PR p185, 2.PR p186. 3.PR p187, 4.PR p187, 5.PR p188.

of the characteristics of a society as dependent upon the actual entities which arise by prehensions, as a kind of 'cause and effect'.[1] She takes as an example the development of life. The greater the number of actual entities with a dominant mental pole, the nearer the nexus, and society as a whole will move towards a high grade society. On this basis the unity of the society as a whole describes life in its members as under unified control, rather than the traditional approach of other philosophies which assume 'life', for example, is more of a 'dissociation', in so far as it is abnormal in relation to the usual pattern. But Prof. Emmet suggests that Whitehead's explanation is lacking in any description of the way in which millions of different centres of experience can be organised in such a way as to gain a single unity of experience.[2]

This comment appears to reflect that of Percy Hughes when he commented on consciousness in the Whiteheadian scheme, and his distinction between a responsive physical feeling and a mental conceptual feeling. It is this which we recognise as leading to the distinction between conscious and unconscious feeling, for in Whitehead's scheme neither the mental nor the physical need be conscious. Whitehead's chosen example of the growth of a tree involves elements of both the physical and mental poles, culminating in the unification of the physical feelings which are then transmuted into a conceptual (mental) feeling. By this means the information and data are conveyed to the limitations of the physical world so that an example of a specific tree can be observed. Thus, according to Hughes, it is not Whitehead's account of societies or transmutation that is the seat of the problem, but rather the omission of any explanation by Whitehead of the development of a 'living' enduring object which is derived from both conscious and unconscious feeling fused into one conceptual feeling. This leads to a need to account for "... the creative alchemy of germ plasm evolving new individuals and new species."[3]

Whitehead has described the means by which the eventualities of such a universe as ours can be catered for, but there appears to be a gap in the explanation for the events and occurrences in the life histories of enduring objects, such as humans, for which

1. (Dorothy Emmet, 1966, p212) 2. (Dorothy Emmet, 1966, p214)
3.(Percy Hughes, Schillp, 1951, p290)

they themselves appear to be responsible. If the process of development, change, evolution and novelty are all to be accounted for within the concrescence of the actual entity, for the clear reason of accommodating both stasis and fluency, this appears to leave a question as to how the scheme caters for the initiative of humans which introduce their own newness at their own level of existence.

Felt concluded his paper with the question as to whether the additional complications associated with Whitehead's doctrine of transmutation do not in fact constitute the straw that breaks the back of the 'Whiteheadian corpuscular elephant'.[1] Thus, he implies that there are just so many difficulties in the entire scheme which demand modification that the original thesis dies the death of a thousand qualifications.
The comments of Prof. Emmet and Prof. Hughes in contrast, appear to seek solutions to the difficulties in the scheme, in so far as they have recognised the premises on which it is constructed. These two differing approaches, though not in any way implying agreement by any commentator with Whitehead's entire scheme, do appear to highlight Whitehead's observation on the relationship between epistemology and ontology as being inextricably linked:

"All metaphysical theories which admit a disjunction between the component elements of individual experience on the one hand, and on the other hand the component elements of the eternal world, must inevitably run into difficulties over the truth or falsehood of propositions, and over the grounds for judgement. The former difficulty is metaphysical, the latter epistemological. But all difficulties as to first principles are only camouflaged metaphysical difficulties. Thus also the epistemological difficulty is only solvable by an appeal to ontology."[2]

1. James W. Felt S. J., Transmutation and Whitehead's Elephant, In: Whitehead and the Idea of Process, Proceedings of the first international Whitehead Symposium, Ed. Harold Holz and Ernest Wolf-Gazo,1981, p184.
2.PR p189.

12 Critical Evaluation

In the first two Sections of this Chapter we examined in some detail the process of organic development at the micro level. In this section we will consider the more general concepts associated with the whole of Whitehead's philosophy of organism and assess the value of the thesis in relation to both the intrinsic value of the arguments involved, as well as any justification for adopting Whitehead's solutions to agreed difficulties rather than some other alternative. We will commence with the scientific background to the thesis, which is the trigger for the speculative philosophical development of the scheme. We will then move to the main proposition that it is only through the recognition of concrete fact as process[1] and that it is the philosophy of organism that describes that process of nature, that the true basis for a philosophical cosmology will be established.

The Scientific background to the Thesis

Whitehead stated his belief, that in every age there is something which is dominant in influencing the outlook of that age and that in the three centuries immediately prior to his life this dominant feature of preoccupation had been 'science'. It has become apparent that by 'science' Whitehead was referring to the preoccupation with the new physics of the 17th Century Scientific Revolution. It was the developments derived from that 'revolution' and the interpretation of the new knowledge, which became the foundation for a cosmology that has displaced any influence of established views derived from other sources for the establishment of a philosophical cosmology. Whitehead regarded it as one function of philosophy to be the critic of cosmologies.[2]

The main ideas selected by Whitehead for consideration were those associated with and derived from that scientific revolution such as 'simple location', 'scientific materialism' and 'materialistic mechanism'. Prof. Emmet believed that perhaps Whitehead devoted too much time to the question of 'simple location'[3] but it is concerned with so many aspects of what Whitehead regarded as error, that there seems some justification for this attention. Bits of matter, conceived as passive and devoid of interior activity, situated and mobile in an unchanging, homogeneous and otherwise empty space, did not describe the world experienced by Whitehead.

1.SMW p87, 2.SMW Pref. xxi, 3. Dorothy Emmet

'Objects', endowed with qualities, developed a self-identity as a result of their apparent permanence over long periods of time. The locomotion of objects was nothing more than changes in spatial relations.[1]

Philosophical writers from Descartes to Newton have offered only a one sided presentation of the evidence of experience.[2] If the term 'actual entity' replaces the term 'sensible object' in Newton's theory of space and time, for example, the philosophy of organism is in agreement with much that Newton proposed. Whitehead wishes to demonstrate that Newton: "...has confused what is 'real' potentiality with what is actual fact."[3] The certainties proposed by Newton have to be considered in the context of the fate of Newtonian physics, which are now recognised as valuable within particular fields of application. The purpose of the study of philosophy involves us in the establishment of the 'larger generalities', which means challenging the half truths of scientific first principles, which are limited to particular times, places and environments.[4]

Whitehead also recognised that the acceptance of the notion of 'simple location' had serious implications for the very base on which the new science was founded, i.e. induction. It was representative of the insularity of the new movement, that it took no regard of Hume's philosophical criticism of the employment of inductive arguments in the scientific method of establishing laws of nature. Inductive arguments demand a recognition of some continuity between nature at one particular period and nature at another, yet this is exactly the dimension omitted from the notion of simple location. But these two incompatible doctrines were permitted to remain side by side within, what we may refer to as, the philosophy of science. Such acceptance only illustrates the anti-rationalism of the scientists of the day.[5]

Whitehead described induction as: "Another unsolved problem bequeathed to us by the seventeenth century...", 6. There was not the general recognition, in the first half of the twentieth century, of its inadequacies in establishing universal laws of nature, that there is now. A much more philosophical approach has been adopted to understanding the progression of scientific knowledge than previously was the case. New knowledge

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1.SMW p72, 2.PR Pref. xi, 3.PR p73, 4.PR p10, 5.SMW p64/5, 6.SMW p53.

concerning the way in which we learn and store information, through link thinking, means that there is a new recognition of the preconceived ideas we bring with us when we are confronted with the interpretation of facts.[1] In short, the recognition of the inadequacies of reliance upon induction as a means for achieving progress in the preparation of a scientific cosmology has led to a widening of the horizons of the scientific world as to the scope of the field of studies required. In Whiteheadian terms, this is the recognition of the need for a wider range of abstractions. To place reliance upon something which is not concrete or reliable 'fact' is to fall into the trap of the 'fallacy of misplaced concreteness'.[2] The way we think is in the consideration of abstractions but the importance is to remember this and recognise the need to bring these abstractions together.[3] Individual sciences are abstractions[4] and although one abstraction may be better than nothing, in order to establish truths which transcend the particular methods employed in the establishment of truths relating to that occasion, it is necessary to employ the information and understanding of as many different abstractions as possible.[5]

Until the 20th Century, science had remained perfectly satisfied with its own set of abstractions.[6] The net result was that the scientific epistemology stressed exclusively, sense experience and sense perception. It provided for none of the psychological needs of humanity. According to the dominant scheme there was no reason to suspect that portions of material things should have any physical relations to each other. There was no suggestion that there could be an organic unity at the base of things upon which organic unities of electrons, protons and molecules could be derived and from which living bodies could emerge.[7] Further, little attention was paid to the continuity between the diversity of types of things such as humans, animals, vegetables, cells, macroscopic entities and micro-physical entities. In particular this led to a disastrous separation of mind body.[8] There was no place for aims, enjoyment or value.[9] Cartesian

1. The Social Learning Theories of Psychologists such as S. Freud, B. F. Skinner, S. R. Ahrens and Albert Bandura, have assisted the understanding of the way in which we rely upon paying attention, accurate reproduction of facts and events, motivation and previous experience, as influences in the way in which the subjective element in analysis of data is important. Studies in this field undertaken by psychologists have led to a new approach in the interpretation of scientific progress and development.
2.SMW p72, 3.SMW p73, 4.SMW p77, 5.SMW p78, 6.SMW p83, 7.SMW p92 8.MT p156, 9.MT p158,

substance philosophy dominated philosophy. Descartes, with his successors, were completely satisfied to accept the development of a scientific cosmology at its face value.[1] Whitehead stressed the notion of activity as something that is important simply because of its own 'self-enjoyment', which includes that of others, with whom we anticipate the future'. The alternative version of Descartes, which contains his notion of perfection, has no place for the concept of quality of existence, the divisions of which are infinite. Whitehead recognised an hierarchy of enjoyment from the lowest types of activity to those of human beings.[2] These vary from the subtle experience of a flower to the intuitive distinction between special and the mundane, or in religious language, the separation of the sacred from the secular.[3] The blurred notion humans have of liberty, activity and co-operation supports the thesis that being an actuality among other actualities is of aesthetic significance.[4]

The net result of scientific development from the 17th Century to the Mid 20th Century was that the previous common sense notions used in the interpretation as to how the universe was 'getting on' have been completely abandoned.[5] The new common sense notion is totally dominated by the new scientific approach, though there is: "sporadic interweaving of old and new in modern thought".[6] Yet in the 20th Century we find that although new discoveries are being made in the sciences almost daily, which challenge the validity of the newly adopted philosophical interpretation of nature, the general conclusions from the discredited doctrines are 'tenaciously' retained. First has been the loss of confidence in the subjectivist sensationalist doctrine of the empiricists regarding perception.[7] This was closely followed by the doctrines of empty space and locomotion, largely initiated by the recognition that light passes through what was initially regarded as empty space. Consideration of the forces of nature, epitomised in Newton's laws of gravity, also failed to provide any meaning, value or reason to the whole of nature:[8] "Combining Newton and Hume we obtain a barren concept, namely a field of perception devoid of any data for its own interpretation, and a system of interpretation, devoid of any reason for the concurrence of its factors."[9] This represents the retention of discredited doctrines by 20th Century science, even though the so called facts which gave rise to the doctrines have long since been abandoned.[10]

1.SMW p22, 2.MT p161, 3.MT p164, 4.MT p165, 5.MT p177, 6.MT p179, 7.MT p180, 8.MT p182, 9.MT p184, 10.MT p185.

We noted the internal developments within science that added to the demand for a re-think concerning the basis of the formulation of scientific laws. These included the change of emphasis from mass to energy,[1] the new theories of evolution,[2] the growth in the biological sciences,[3] the recognition of endurance as the result of the reiteration of pattern,[4] changes in the notions of the nature of the atom,[5] recognition of the importance of the environment,[6] and the two new theories, that of relativity[7] and the Quantum theory.[8] Whitehead pointed to the conclusions in scientific thinking derived from these developments.

1.SMW p124-126, 2.SMW p126, 3.SMW p128-135, 4.SMW p135-137,
5.SMW p137, 6.SMW p138, 7.SMW p143-160, 8.SMW p161-171

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Appendix A David Scully's latest hand written notes 23/09/2001

The remaining items of Common Sense notions of 16th Century Science were finally erased by Modern Science, (in its interpretation) of the new discoveries. The retention of aspects of Newtonian Physics are refined and used in the interpretation and reconstruction of the advances in modern Physics. MT 185. "The result is to reduce Modern Physics to a sort of mystic chant over an unintelligible Universe." This mystic relation of observation, theory, and practice, is today's equivalent of the old magical ceremonies flourishing in Mesopotamia in 1 Millennium BC (first few hundred years BC)

Ref. to Ether 186. "The empty space was conceived as filled with Ether." The unification of disparate bits of matter was thus accomplished then various doctrines of light, heat, electricity and energy. 187

That trend of 19th Century Physics carried on into the 20th Century. 188 Matter to energy led to notions being expressed in terms of energy, activity and velocity energy of Space-Time. Now the agitations of energy (replacing matter) are fused into its own environment resulting in a doctrine which states that the endurance of objects such as tables, chairs, planets etc. is the time-factor becomes endurance (of the object) and change is but as a mere detail.

"The fundamental fact, according to the physics of the present day,..... abstraction."

Such conclusions and therefore doctrines permeate other sciences e.g. physiology and genetics. Genes as determinants of heredity can lead to the effect of the animal body in which they inter i.e. matter does not change. However today some physiologists are suggesting that environment can affect the genes and modify them.

Other examples of survival of fragments of old doctrines in light of Space-Time 190 of ..... on where laws of gravity come from. NOT a combination of Newtonian Laws and notion of occupancy of Space and Euclidian Geometry.

<u>The new views are activity and process 191</u>

<u>All leads us onto p.197.</u> The remaining undiscussed question

"What are the primary types of things in which the process of the universe is to be understood?" 197

The remaining claims of Common Sense notions of 18th Cent Sc were finally
erased by Mod Sc. (in its interpretation) of the new discoveries
the retention of aspects of Newtonian physics / physics are retained and
used in the interpretation & reconstruction of THE ADVANCE IN modern physics, 185 (47)
The results to reduce Mod Physics to a set of hypothetical [illegible] over
a countless [illegible] UNIV. The mystic rebirth of [illegible] & [illegible]
is [illegible] = of the old magical conceptions flourishing in MESOPOTAMIA Mesopotamia
between 1 Millennium BC. (first few 100 yrs BC.)
Ref to Elta 186 empty space conceived as filled with Elta.
the unification of desperate bits of reality was thus accomplished then
various doctrines of LT, Heat, electricity, & energy 187
THEORY that trend of 19th Cent Physics carried on into 20th Cent
188. matter to energy led to notions being expressed in terms of
energy, activity & relative energy of space time. Now the conception
of energy (replacing matter) on [illegible] its own amount resulting
in a doctrine which states that the existence of objects such as tables
chairs, planets etc is the last factor becomes existence (of the
objects) and change is but as a mere detail.
"The fundamental fact of the whole Physics of the present day — abstraction"

Such confusion & its doctrines permeate other sciences eg. physiology, and
genetics. Genes as determinants of heredity have been lead to the effect
of the content body in which they inherit: a matter cannot change.
However today some physiologists are suggesting that one can affect the genes
& modify them. Other example of Survival of fragments of
old doctrines in body of Space Time 190

of location where bond could come from. NOT A Combination of Newtonian theory, + Nobis [illegible] of Space + Euclidean Geometry

The new views on activity x Process 191 Lexicon of clouds

All leads as at P.197 The remaining undiscussed Q !!
"what are the primary types of things in which the process of the crone-
ought to be embodied?" 197.

Appendix B **David Scully's post-tutorial notes 22/09/2001**

Section 12 Post Tutorial

25-30 Min. Section 20

No detailed repetitions, refer only to items.

Give it a name e.g. The Cosmological Theory

Say exactly what the thesis (his) asserts

Analyse this thesis – What exactly does it assert.

Enter into a Critical Consideration.

Develop particular points – develop aspects of them.

N.B. Change of Style in this Section

W's outlook

W. projecting into nature 'Protopsychic aspect'

(retain this Term)

Teleology – the aim of Nature -> Satisfaction

Can this be projected back into all of Nature

Evidence for his thesis (See my point) – What did W suggest

Direction of Modern Science – is it compatible with W.

(Defend /not The speculative aspect)

The field theory is AE And Nature in general

ME

Kuhn's version of Paradigm Shift

The aptitude of Roy Wood Sellars

Psychological aspects

Other theories (met) Why Ws

Appendix C Cosmologies

Whitehead's suggestion that modern cosmologies are influenced by the physics of the 17th Century in conjunction with the notions of a transcendent God making an accidental universe, finds some support from the theories of Steve Jones. In a recent commentary on Darwin's Origin of Species, he suggests that biology and evolution have largely become the study of genetics. He describes Darwin's explanation as a 'machine' which is no more than genetics plus time.* Whitehead has little to say on genetics, as the term is generally understood within biology, though it is clear he does regard it as the determinant of heredity.** However, he is concerned that the study of genes appears to proceed without consideration to their environment. Evidence that environment is important is derived from the fact that genes appear to be modified in some way by their environment. Hence, Whitehead's conclusion that there is no 'a priori' argument that the inheritance of characteristics can be deduced simply from a doctrine of genes. MT p189/90

According to Jones, a biological answer to the difficulty of the gaps between species has now been found in genetics, which transforms our understanding of evolution.*3 Thus, apart from detail, no biologist denies the truth of the 'Origin of Species' and of descent with modifications.*4 Natural selection picks up differences in the capacity to reproduce so that the most efficient at reproduction multiply more quickly and take over the others, thus, evolution is inevitable.*5 Thus, the description of evolutionary development is based upon 'mistakes' in reproduction.

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* Steve Jones, Almost like a Whale, the Origin of Species Updated, Doubleday, 1999, It should be said that Jones makes it clear that he is not attempting to produce a cosmology. He is convinced that an evolutionary theory of everything based upon biology, along the lines of that discussed in physics, is a long way off. p xxvii.
**Whitehead's use of the term 'genetic' is used mainly to describe the relatedness of actual entities in their inheritance from their datum PR p84, or, in respect of genetic division, where he describes the philosophy of organism as a 'cell theory of actuality' when such a cell is considered genetically of morphologically. PR p219.
*3 Steve Jones, Almost like a Whale, the Origin of Species Updated, Doubleday, 1999, pxxii.
*4 Steve Jones, Almost like a Whale, the Origin of Species Updated, Doubleday, 1999, pxxiii.
*5 Steve Jones, Almost like a Whale, the Origin of Species Updated, Doubleday, 1999, pxxiv.

Jones offers the analogy between genetic reproduction and a photocopier which make indefinite numbers of copies. Each copy is less exact than the original so that information is transmitted only with loss i.e. a duplicate is less perfect than the original. The changes of reproduction are the errors of descent. Jones case is that reproduction always involves modification with the copy being less exact than the original. Thus in this re-interpretation of Darwin's 'Origin' the explanation is clearly tainted with the pre-conceived ideas outlined by Whitehead, which he believes infect almost all the cosmological theories of modern science.

Included in Jones' assumptions is the inherent belief that there is an original from which all copies are made. Such a notion reflects the Garden of Eden story, with the rejection of its two originals. The failures, weaknesses and inadequacies of the originals were introduced, through their own and subsequent reproductions, into all their copies, which has become the cause of what the world has subsequently experienced over its life-span. All is attributable to the transmission of inferior copies.

Apart from the fact that the analogy with a photocopier is for many reasons suspect, not least because of what a modern copiers can do to improve the original, several questions remain. For example, questions as to the derivation of the value judgement which describes change as 'descent' rather than 'ascent';* and justification for referring to all changes as mistakes. Does a value judgement itself not require an explanation? It appears that this explanation from genetics, commences with a 'given' in the form of an original which simply has to be accepted, just as Newton accepted the world as given before he began to describe and explain it as an abstraction.

Such inadequacies in modern theories of evolution may be compared and contrasted with the doctrine of the philosophy of organism concerning reproduction which is based upon the notion of change and progress towards novelty. The meaning of the word 'origin' in that philosophy relates in a more fundamental way to the origin of everything and not simply to a particular species, to a life form or to consciousness. The essence of the philosophy is founded upon becoming and relatedness and is summed up in the doctrine that: "...the creative advance of the world is the becoming, the perishing and the objective immortalities of those things which jointly constitute stubborn fact." PR Pref. pxiv

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6 Needham refers to 'ascent'.

More recent attempts to construct a cosmology which can account for life, employs the traditional materialistic doctrine and develops what may be described as a modern version of the doctrine of Vitalism. This is commonly referred to as the 'Anthropic Principle'. In so far as it attempts to explain the existence of sentient, conscious beings in a material, mechanical universe, it may be described as being to Vitalism what Logical Positivism is to Empiricism.

The foundation of the argument is that by 'fine tuning' the physical parameters of the events of the universe, an explanation can be found for the genesis of carbon based life'. One of the main areas of study is related to the question of the relatively late appearance of life in the universe. What it demonstrates is a revived interest in the need to account for organic material and life in the universe. Joseph Zycinski believes that the strength of the new study is in its detachment from metaphysical assumptions which free the arguments from the accusation of bias. ( ) Thus the relevance of this Principle for inclusion in, if not the foundation for, a cosmological picture, is established. However, there is a major difference of emphasis between this approach of the Anthropic Principle and that of the Philosophy of Organism, in so far as the latter does not accept the premise of a materialism at the base and foundation of things, nor would it find any solution to the question of the appearance of human life on our planet particularly significant in answering questions of a more fundamental nature which relate to the nature of life itself. The description of a living person in the philosophy of organism involves the separation of the entirely living nexus from the social nexus of personal order which has ensued from a particular historic route of its members. As Whitehead expressed it: "It is not the essence of life to be a living person." PR p107 Thus, questions relating to human life and existence are secondary to the question of life itself.

*Joseph Zycinski, 'The Philosophical Significance of the Weak Anthropic Principle', International Conference - The Interplay between Science, Philosophy and Religion: The European Heritage. Institute of Philosophy, Katholieke University, Leuven, November 1998, p.

3. Life, Consciousness and Mentality in terms of the Mind / Body problem.

What these three topics, life, consciousness and mentality have in common is that they are all related by the current notion of the di-polar actual entity. This is the problem of being able to give an account of how the mind or simply mental processes, are related to the many bodily states and process of which we are aware. This section will consider how Whitehead's analysis of these topics takes us beyond the current dichotomy between mind and body, as presented in modern philosophical analysis. This dichotomy is maintained in spite of the fact that such an analysis accepts the intimate relationship the two have together, while attempting to retain the separate and distinctive identity of each. We will consider Whitehead's description and attempts at explanation of the problems, some responses to his analysis and finally possible steps forward towards a more realistic 'provisional realism' than has so far been provided by the answers which are currently available.

The origins of the mind / body problem are generally attributed to Descartes. Cartesian duality of two substances, mental and corporeal or mind and body in modern terminology, represents for Whitehead the worst kind of incoherence in any philosophy which is possible. (PR 6) Two independent substances which require nothing but themselves in order to exist, but which have a causal relationship, become the constituents of the human being i.e. human mentality is partly the outcome of the human body. Human mentality is partly the result of the whole body but is also regarded partly as the agency directing thought process which apparently has only a tenuous connection with the body. (PR 108) A typical concept of the method of operation of the system is epitomised in the description of Thomas Aquinas who regarded the mind as 'informing' the body. In a living body the high-grade occasions are co-ordinated through the routes by which they inherit through the body. The brain as part of the body also has a co-ordinating role, so that the richness of the experiences may be inherited by the 'presiding personality' in the body. As a result the human mind is conscious of what it has apparently inherited form the body. (PR 109)

It is again to the doctrine of concrescence that we turn for a description in the

philosophy of organism of its solution to the mind / body problem.
The actual entity is bipolar, physical and mental, such that physical inheritance is accompanied by conceptual reaction, which introduces emphasis, valuation and purpose into the process. Concrescence is the word given to the combining of the mental and physical sides into a single unit of experience, which is described as 'self-formation'. Mentality is always conceived as non-spatial and a reaction from the physical experience which is spatial.

According to Whitehead's organological philosophy, 'life' is at the very centre of the physical structure of nature. (SMW 116) Life is an aim at the perfection which is permitted by the conditions of a particular environment. (AI 81) But the nature of life itself is not to be discovered by the investigation into different societies which may be described as 'living' as a result of the characteristics by which the society is defined. An entirely living nexus is not itself social, for it acquires what is required for 'life' from the prehensions of its social environment. However the living nexus may support a may support a thread of personal order in an historical route which is a 'living person'. Thus a distinction is made between the essence of life and a living person. (PR 106) It is in so far as life is dependent upon its social nexus that life may be manifest by degree, making a challenge to current notions of a 'cut-off' between living and dead matter, or between organic and inorganic material. (MT 34/5 and 215)

All life in the body is in cells, hence the recognition of the millions of life centres in the body. From this Whitehead suggests that what we should conclude is that what is truly in need of an explanation is not the theoretical duality or dissociation of mind and body but rather the unifying control which gives both unified control of behaviour as well as consciousness of the unified behaviour. (PR 108)

So life, as described in the philosophy of organism, is constituted on the basis of recognisable enduring societies in nature which acquire endurance within a social order. Characteristics of a self identical pattern in a supportive structure account for physical objects such as tress and animals. The animal body is a strand of personal order which develops simple self identity through a stream of personal experience. It is this stream of personal experience which is termed the self. A difficulty with this description, observed by Wolf Mays, is that this personal society is described by

Whitehead as simply a thread of temporal transition which lacks spatial extension.(194)
Life itself dwells in the spaces of the cells. (PR 106) Mays notes Whitehead's own recognition of the need of the animal body to 'shelter' this route of experience of an entirely living nexus, and that he explains how this protection occurs, but the difficulty is that it takes us onto the problems of psychological physiology.

Consideration of the physiology of the body helps to highlight the unnecessary problems created by this Cartesian Duality of mind and body. The automatic nervous system operates generally without informing the mind directly through conscious awareness of its functions, but it is exactly the smooth functioning of this aspect of the body which permits a feeling of well being in the body, and thus the well being of the person. But this observation is exactly the opposite of the teaching of Locke and Hume, which has largely been followed to the present day, that emotional feelings are necessarily derived from sensations. (PR 141) The philosophy of organism reverses this order to one in which we prehend other actual entities in a more primitive, direct mediation of emotional well being. The direct mediation of the senses is reduced to a secondary, less significant role. The two are fused in the important role of perceptual knowledge. This is fundamental in the philosophy of organism where the problem is completely transformed through its own doctrines of 'hybrid physical feelings' and of 'transmuted feelings' as described in categories of Conceptual Valuation (iv) and Conceptual Reversion (v). (PR 26 and 250)

Whitehead's assertion that individual living occasions do not have a separate existence apart from the organic event of the cell, and also that the relationship of the inorganic event of the cell is such that it does not have a separate awareness or mind or stream of personal experiences of its own, with its own identical character, but is a total unity with the life that it supports, are also problems for Dr. Mays. Life can be described under these conditions as the organisation of a particular kind of novelty of character within enduring objects. In the words of Dr. Mays: 'an organism is alive when its behaviour cannot simply be explained in terms of the antecedent physical events'. (199) But in terms of physics this is not saying anything very startling because descriptions of life are left to the biological sciences.

Looking then, to the biological sciences only confirms Whitehead's own observation

that the evidence available on this matter, in the form of empirical fact. is minimal and is something which adds greatly to the problem. (PR) That this is so becomes apparent from the retention by the biological sciences of attempts at descriptions of life which are based upon the discredited materialistic, mechanistic doctrines developed after the 17th century scientific revolution. For example we are informed that the first recorded attempt to offer a scientific descriptions of the origins of life is found in the suggestion of S W Fox, who wrote in 1912 that life originated by intense heat effecting a change in amino acids such that they formed polymers which were water solvent. In 1936 the Russian chemist Operin suggested that life evolved by chance through random events in chemical processes in the oceans. A biochemical 'soup' was able to form which was conducive to life. A theory of this type is still the most widely held view today. (427)

The astronomer Fred Hoyle was being somewhat more specific in suggesting that life first appeared on Earth about 3,500 million years ago in the form of simple bacteria. Over the next 500 million years types of algae appeared. (143) Hoyle is convinced that the ingredients for life exist throughout the gas clouds within our own galaxy and in other galaxies. He also suggests that the comments of Operin are now fairly well understood as to the first steps in life's origin, when simple inorganic molecules became more complex ones of up to 30 atoms and organic ones molecules of amino acids. (155) The energy for this essential first step was supplied by the sun. (157) Hoyle's belief is that most commentators regard this description as a 'highly probable event'. ( )

At the present juncture of the limited availability of evidence, what can be done is to compare such descriptions as those above, as an explanation of life based upon discredited doctrines, with the attempt at a provisional realism based upon a total scheme of philosophy which encompasses, because of its very nature, an attempt to account for the totality of things experienced in nature. But, however sympathetic we may be to Whitehead's attempt to accomplish such a task we should note Mays' important distinction between Whitehead's statement that life is 'originality of reaction' which adds nothing particularly new to recent scientific thinking, and his description of novelty as arising from a living nexus within the inorganic apparatus, which is quite radical and new. The first is a description but the second is an

explanation and that is what some find difficult to justify. (199)

( ) The Time tables of Science, Simon and Schuster, 1988, Alexander Hellmans and Bryan Bunch, p427.

( ) Fred Hoyle, Ten faces of the Universe, Heinemann, London, 1977 p143, 155, 157.

( ) The most recent version of a theory based upon the old materialism of the 17th century has been presented by Adrian Tuck on behalf of an 'International team of researchers at the Royal Society's millennium conference in Cambridge this week.'. This suggests that water droplets produced by breaking waves could have drifted high into the sky and thereby provided just the right conditions required for the necessary complex molecules for life to form.
Life from the Skies, New Scientist, 5th July 2000, p4-5.

What it is also important to note is the veracity of the fact that all forms of organisms, animal and plant life, single celled life and microcosmic events, as modes of existence, merge into one another. All life forms appear to need one another. Diverse modes of organisation produce diverse modes of functioning with apparent continuity between modes. If gaps are filled by borderline cases, as Whitehead suggests, (MT 216) then this would only reflect the nature of objects at the macrocosmic level of existence. All this suggests that the so called gap between living and dead matter really is too vague to bear the weight of so great an assumption as that which assumes a dichotomy between the two. (MT 216) As Whitehehad suggests, it may be more appropriate and productive to enquire into what is the evidence for that dichotomy?

4. The philosophy of organism and modern science.

It should now be patently clear that Whitehead is not in conflict with the scientific advances in knowledge or the quest to discover more about the physical nature of creation of the sciences as a whole, but rather that his interpretation of the new developments within science are nearer to the evidence provided by observation of physical nature and especially so, in relation to the lesser abstraction of physics which are so often misguided and based upon erroneous assumptions and doctrines. Further in this period the principles at the base of scientific thinking have given way to a method of judgement by results. This takes it further than ever away from the quest of the philosophy of organism which is searching for first underlying principles of nature. (SMW 121)

Pressure to move away from scientific materialism came from several new notions, to challenge the old established assumptions and which in many cases could be used to support the theories of the philosophy of organism. The doctrine of evolution in biology had a major impact in this latter direction (see section 3.12) with the recognition that a new and different environment leads to the development of new forms (SMW 134) while the notion that a physical field of activity which permeates all of space, including what was previously considered to be a vacuum, developed from the wave theory of light, worked in conjunction with the outcome of the work of James Clerk Maxwell in uniting the forces of electricity and magnetism, leading to the recognition that there ought to be electromagnetic events throughout all space. (SMW 123)

A third new field of study involved the theory of the conservation of energy in which the analysis of the notion of a general flux of events led to the belief in an underlying eternal energy. The concept of a realm of eternal energy suits very well the need of the philosophy of organism with its concept of a realm of eternal objects which are justified by the concept of enduring thought patterns. This fits the need to account for value which is done in the philosophy of organism through eternal objects. (SMW 132) The theory of evolution is also associated with the laws of enduring pattern, which suggest that the state of the universe at a particular period is determining the characteristics of the entities the modes of functioning of which express these laws of pattern. (SMW 134)

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The philosophy of organism regards the cell theory of biology as analogous to the theory of the electrons and protons in physics. The two theories are independent exemplifications of the same idea of atomism. Pasteure's work has demonstrated the concept of an organism at an infinitesimally small magnitude and can be smaller than the size of the atom. (SMW 126) Thus the concept of the atom as the smallest entity was broken down. The changes in the theories concerning the nature of the atom raise

questions relating to the permanence of what may be described as the ordinary matter of nature. The recognition of the atom as destructible is of immeasurable importance. From the standpoint of an organological philosophy it was unfortunate that the initial reaction of physics was to continue with its materialistic interpretation of nature and substitute the indestructible atom by the indestructible proton and electron. (SMW 137)

However it is still true that the domination and rule of materialism was seriously challenged. Nor was its cause helped by the formulation of relativity theories. But it encounters its most serious threat from the formulation of the quantum theory which could not be accommodated within the framework of the classical theory of the atom. (SMW 163) The difficulty for classical physics was to accommodate the effects, which appear capable of gradual increase or diminution, but which in reality are only achieved by certain definite leaps or jumps. (SMW 161) Experiment shows that there is a definite amount of energy which is essential for the process to proceed and this cannot be compromised in any way. Further, a rule or law can be constructed which describes the energy levels required between jumps. The difficulty in fitting this theory into the doctrines of classical physics, which gives free reign to electrons in the atom, is to be able to explain how the electron considered to run in grooves or tracks, in which the vibratory energy reveals itself. (SMW 164) The response of the quantum theory with its notion of the discontinuity of matter, in order to be able to explain the phenomena, demands at least a serious revision of physical concepts of science. (SMW 169) It also presents the philosophy of science with a new concept of the discontinuity of matter.

Whitehead's estimate of the situation was that physical science was displaying similar symptoms to those demonstrated in astronomy at the period of the epi-cyclic controversy between the Ptolomaic geocentric system and the of Copernican