SCIENCE, SELF-KNOWLEDGE & SPIRITUALITY



A Feedback Model of Bernard Lonergan's Philosophy of Human Consciousness

PATRICK B. CREAN





151 Howe Street, Victoria BC Canada V8V 4K5

© 2011, Patrick B. Crean. All rights reserved.

Without limiting the rights under copyright reserved above, no part of this publication may be reproduced, stored in or introduced into a retrieval system, or transmitted, in any form or by any means (electronic, mechanical, photocopying, recording or otherwise), without the prior written permission of both the copyright owner and the publisher of this book.

For rights information and bulk orders, please contact info@agiopublishing.com or go to www.agiopublishing.com

A license to reproduce excerpts from Four Quartets by T.S. Eliot and Collected Poems 1909-1962 by T.S. Eliot has been obtained from Faber and Faber Ltd., publishers.

Science, Self-Knowledge & Spirituality ISBN 978-1-897435-60-1 (trade paperback) Cataloguing information available from Library and Archives Canada.

Printed on acid-free paper.

Agio Publishing House is a socially responsible company,
measuring success on a triple-bottom-line basis.

10 9 8 7 6 5 4 3 2 1

DEDICATION

To my family and friends,

Former students and colleagues,

Who listened, questioned, read and discussed!

ACKNOWLEDGEMENTS

I much appreciate most helpful reviews of this text by Fr. F.E. Crowe, S.J., of the Lonergan Research Institute, Toronto, and Professor Hugo Meynell of the University of Calgary. I am particularly indebted to Mr. Don Render for the care and thoughtfulness in the manner of its presentation, also to Ms. Rosalie Rutka and Mr. Alex O'Neil for assistance in the final preparation of the text.

I would also like to thank Ivan Gaetz and Jean Nordlund of Regent College for a careful editing of the text; also St. Mark's College, University of British Columbia, for the opportunity of presenting the introductory lecture series on which this text is based; the patient students who attended those tentative endeavours; and the many friends who contributed through their interest and discussion.

I am also most grateful to our dear friend, Suzanne Barois, and to Bruce Batchelor of Agio Publishing House for their encouragement and invaluable direction in bringing this document, completed in the late nineties, to its final publication over ten years later.

Finally, I should like to thank my wife, Wendy McFeely, with whom so much of this material has been both lived out and discussed.

Patrick B. Crean, September, 1999 (edited April, 2011)

TABLE OF CONTENTS

| | Prefa | ce | i |
|------|-------|--|----|
| I. | INT | RODUCTION | 1 |
| II. | FUN | IDAMENTAL NOTIONS | 13 |
| | 2.1 | Substrate | 13 |
| | 2.2 | Operations | 14 |
| III. | INT | ENTIONALITY ANALYSIS | 17 |
| | 3.1 | Dramatic Instance | 17 |
| | 3.2 | Intentionality | 18 |
| | 3.3 | Cognitive Activity Prior to Expression | 20 |
| | 3.4 | Cognition With Expression | 26 |
| | 3.5 | Relation – An Illustration | 34 |
| | 3.6 | Feelings | 36 |
| | 3.7 | Feelings and Intentionality | 37 |
| | 3.8 | Feelings and Intersubjectivity | 40 |
| IV. | COC | GNITIVE AND AFFECTIVE DEVELOPMENT | 43 |
| | 4.1 | Cognitive and Affective Synthesis | 43 |
| | 4.2 | Development | 47 |
| | 4.3 | Verification | 50 |
| | 4.4 | A Metaphor Approximating the Human Journey | 54 |
| V. | MEA | ANING AND CONVERSION | 57 |
| | 5.1 | Summary of Operations | 57 |
| | 5.2 | | 59 |
| | 5.3 | 0 | 61 |
| | 5.4 | | 62 |
| VI. | IND | IVIDUAL AND COMMUNITY | 67 |
| | 6.1 | Order and Community | 67 |
| | 6.2 | Personal Relations | 69 |

| VII. | OUR | .WORLD? | 73 |
|--------|----------|--|-----|
| | 7.1 | The Emergent | 73 |
| | 7.2 | Emergent Probability | 85 |
| | 7.3 | The Supreme Adventure | 89 |
| VIII. | BREA | AKDOWN | 93 |
| | 8.1 | The Problem | 93 |
| | 8.2 | Psychic Operation | 95 |
| | 8.3 | Bias | 98 |
| | 8.4 | Alienation | 100 |
| | 8.5 | Individual and Community | 101 |
| IX. | REC | OVERY | 105 |
| | 9.1 | The Psychic Problem | 105 |
| | 9.2 | The Spiritual Dimension | 107 |
| | 9.3 | The Symbolic Animal | 110 |
| X. | ETH | ICS | 119 |
| | 10.1 | The Transcendental Precepts | 119 |
| | 10.2 | Development of Will | 121 |
| | 10.3 | Prayer | 122 |
| | 10.4 | Authenticity | 123 |
| XI. | CON | ICLUSION | 127 |
| | 11.1 | The Human Journey | 127 |
| Appe | ndix 1 | Good and Evil in Our Time | 135 |
| • • | | Cosmos – Consciousness – Community | 135 |
| | | Cognitive – Affective Growth | 137 |
| | | Decline in Community – A Practical Example | 144 |
| | | Conclusion | 148 |
| Appe | ndix 2 | The Divine Office: A Personal View | 153 |
| Appe | ndix 3 | Symbols of Transformation | 157 |
| Biblio | graphy | and Further Reading | 161 |
| Gloss | ary | | 167 |
| Abou | t the Aı | ıthor | 241 |

PREFACE

At the beginning of his book, *A Brief History of Time*, Stephen W. Hawking recounts how, at the end of a lecture on astronomy by a well known scientist, a little old lady at the end of the room said, "What you have told us is rubbish. The world is really a flat plate supported on the back of a giant tortoise."

The scientist gave a superior smile before replying, "What is the tortoise standing on?"

"You're very clever, young man, very clever," said the old lady. "But it's turtles all the way down."

In an excellent review of recent developments in the field of theoretical physics, *The Mind of God*, Paul Davies refers to this story in his concluding chapter and poses the question, "Can we make sense of the universe without turtle trouble? Is there a route to knowledge – even "ultimate knowledge" – that lies outside the road of rational scientific enquiry and logical reasoning? Many people claim that there is. It is called mysticism."

Davies distinguishes mysticism from its association with the occult, paranormal fringe beliefs and describes, "the essence of the mystical experience then, as a type of shortcut to the truth, a direct and unmediated contact with a perceived ultimate reality."

A number of instances are presented in Davies' book in which "scientists and



mathematicians claim to have had sudden revelatory insights akin to such mystical experiences." Thus for example, he recounts the experience of Fred Hoyle, who, working on a cosmological theory of electromagnetism that involved some daunting mathematics, decided to take a holiday in the Scottish Highlands. "But somewhere on Barnes Moor, my awareness of the mathematics clarified, not a little, not even a lot, but as if a huge brilliant light had suddenly been switched on. ... When ten days later or so I returned to Cambridge, I found it possible to write out the thing without difficulty."

It is of particular interest that this account of contemporary developments in the most demanding and exacting of scientific disciplines should conclude with a reference to the central role of insight and its implication of the mystical.

It was by meticulous attention to the nature of mathematical and scientific insight that Bernard Lonergan developed his masterwork, *Insight: A Study of Human Understanding*. In the preface he notes, "The dynamic cognitional structure to be reached is ... the personally appropriated structure of one's own experiencing, one's own reflecting, judging and deciding. The crucial issue is an experimental issue, and the experiment will be performed not publicly, but privately. It will consist in one's own rational self-consciousness clearly and distinctly taking possession of itself as rational self-consciousness. Up to that decisive achievement, all leads. From it, all follows. No one else, no matter what his knowledge or eloquence, no matter what his logical rigour or his persuasions, can do it for you. ... more than all else the aim of the book is to issue an invitation to a personal decisive act. ... Though I cannot recall to each reader his personal experiences, he can do so for himself and thereby pluck my general phrases from the dim world of thought to set them in the pulsing flow of life." (INS, p. xviii, xix)

"Thoroughly understand what it is to understand and not only will you possess the broad lines of all there is to be understood but you will also possess a fixed base, an invariant pattern opening upon all further developments in understanding." (INS, p. xxviii)

PREFACE ♦ iii

"The structure of the universe proportionate to man's intellect is revealed." (INS, p. xxix)

Clearly there arises a question as to whether intellectual mastery of such a massive work, and associated materials, is necessary to grasp the practical essentials, their employment for the enrichment of one's life in this world, not to mention their startling implications with respect to what is usually termed the next. In point of fact, in the words of Sir Arthur Eddington, "Observation and theory get on best when they are mixed together, both helping one another in pursuit of truth. It is a good rule not to put overmuch confidence in a theory until it has been confirmed by observation. I hope I shall not shock the experimental physicists too much if I add that it is also a good rule not to put overmuch confidence in observational results that are put forward until they have been confirmed by theory." (Eddington, 1959)

Such complementarity of theory and observation would appear pertinent in the present context. In my own experience the fascination deriving from a chance attendance at a Lonergan seminar in August, 1958, was to extend over two decades before being able to establish for myself a basic practical working model of, in Lonergan's words, "one's mental apparatus." In retrospect, this seemed to be largely due to a complete lack of any practical sense of direction, any indication of where it was supposed to lead, in my own solitary endeavours. As Lonergan has pointed out, the great problem is that we have to live life before we know *how* to do it.

This primer, however inadequate, is intended to establish, for the many individuals as innocent as myself in pertinent scholarly formation, such a sense of direction and some idea of its rewards. However, one "must pluck the phrases from the dim world of thought and set them in the pulsing flow of life." (INS, p. xix) That means questioning and verifying every word and phrase in the context of one's own conscious processes. For that reason the text has been kept to a minimum, a more detailed development being confined to what is hopefully a self-contained introductory glossary of terms.

As for the outcome, it is in no small manner concerned with the release from that fundamental tension of inquiry, that fateful undertow of existential dread of a human journey that, it would appear, must end in a dissolution back into the dust of the universe from whence briefly we each emerge. If mysticism be concerned in some manner with such release, the journey of the mystic has always been demanding. In the words of the anonymous author of the *Cloud of Unknowing*, an English mystic of the 14th century, "And therefore swink [toil, labour] and sweat in all that thou canst and mayest, for to get thee a true knowing and feeling of thyself as thou art; and then I know that, soon after that, thou shall have a true knowing and a feeling of God as He is."

In writing of Lonergan's transcendental method and its implication in terms of interreligious dialogue between East and West, William Johnston in *The Mirror Mind*, notes that "the mysticism of the future will outshine in splendour anything that has existed in the past. We are experiencing a great leap forward in consciousness that will dominate the religious experience of the future."

Whatever the individual calling or vocation, I should be greatly pleased if this modest attempt might facilitate some such personal movement forward, as rewarding and dramatic for the reader as, indeed, it has been for the writer. For more of my personal journey, please read my autobiography, *Pictures On My Pillow: An Oceanographer's Exploration of the Symbols of Self-Transcendence*.

I. INTRODUCTION

"By a model ... is meant simply an intelligible, interlocking set of terms and relations that it may be well to have about when it comes to describing reality ... something worth keeping in mind when one confronts a situation or tackles a job." (M, p. xii)

Despite the myriad distractions offered by the contemporary world, there come moments when the ultimate questions arise unbidden. Do my life and my inevitable death have any meaning? No matter how remote that latter eventuality may seem to be when riding some crest of life's waves, it would seem there must come that conscious moment when there is nothing to look forward to except the last of them – or can we even be sure of that?

There is no lack of people, movements, organizations that will promise you a ticket to Paradise, one way or another, secure in the knowledge that by the time you can verify their claims you are unlikely to be in a position to do much about them! Can one ever know, really know, what it is all about? My answer would be that, though you can't have all the answers to all the questions, you can certainly get enough answers to leave the mind utterly entranced by the magnificence of that to which one has access through the gift of consciousness.

Perhaps my first conscious realization of the problem occurred as a rather small schoolboy on a suburban railway platform in pre-war London, watching the crowd bound for the city, young and old, newspapers, brief cases, umbrellas – thus the pacing of a life, perhaps the 8:15 up to town in the morning, the 5:31 back in the evening until age, infirmity and death intervened. It was a thought that recurred in dark moments, none more so than in the summer of 1958, the terrible sense of entrapment in circumstances from which there seemed no

2

escape, something untouched by conventional religious observances, by homilies that seemed to have less and less to do with the real world in which one had to live, to survive, to find some sense of meaning.

One evening, having nothing better to do, I sat in on a question and answer session, at St. Mary's University, Halifax, Nova Scotia, associated with a series of introductory lectures by B.J.F. Lonergan in connection with his book, *Insight: A Study of Human Understanding*, published in 1957. If the content of the exchanges that evening passed far above my head, there remained an indelible impression made by the principal speaker. If only one could glimpse something of the nature of the universe as he could see it! Acquiring a copy of *Insight* I started on an enterprise that has proved as fascinating, rewarding and enduring as the promise of that single encounter. *Insight* is an invitation to an experimental project, to the rational possession of one's own rational self-consciousness, how it works, can fail to work, its role in the universe and ultimate destiny. If the academic task requires a level of scholarship usually involving several years of full-time university studies, the practical task was to produce a "working model" of human consciousness that could be tested and verified in the context of one's day-to-day living.

An extended article in *TIME* magazine in 1965, referred to *Insight* as an "authentically towering masterpiece," and to "Lonergan's dense elliptical prose studded with references to Thomas Aquinas and modern physics ... Using a vocabulary uniquely his own, he has written a general field theory of the mind – the origin and nature of human insight, how it relates to the various forms of expression, whether in the formulas of the physicist, the word pictures of the poet, the concepts of the philosopher." For myself, however, it was sufficient to extract enough for a "working model" and test it. If the results far exceeded any possible earlier expectation, it would take almost two decades, partly due to the fact that it was only in a subsequent book, *Method in Theology*, published in 1972, that I found the further "parts" needed to complete the "feedback loop." It is in fact a skeleton working outline of Lonergan's synthesis, a synthesis that includes elements drawn from the greatest giants of human thought over

millennia – Plato, Aristotle, Augustine, Aquinas, Kant, Newman, Heisenberg, Einstein, Godel, Freud, Jung, to name but a few – a worldview both rationally coherent and compelling.

There is a deep-set conviction, stemming from one's earliest infantile encounters with some sort of "outside world," that reality is limited only to that which can be verified by our external senses. However inescapably "real" the impressions made upon our senses by the material world, when scrutinized in detail this familiar concrete matter of daily experience, including ourselves, dissolves in a swarm of fleeting ghostly images. Even the purest vacuum is a ferment of quantum activity. Each microscopic entity behaves sometimes like a tiny particle, sometimes like a wave, depending on what sort of measurement is attempted. Not only that, but the wave is completely unlike that occurring in any ordinary physical sense but is of the nature of knowledge or information. It is a wave that tells the observer what can be known about the entity in question and that such knowledge is strictly limited.

It would appear that the universe came into existence abruptly in a gigantic explosion, a titanic release of what would appear to be its fundamental "raw material," energy. Over aeons this energy has been informed and actuated to yield more and more complex structures, higher and higher levels of system, schemes of recurrence.

Earlier schemes of functioning can be retained to provide the grounds for successfully functioning higher schemes. The highest known level of complexity is that associated with human consciousness. Thus, it would appear, according to Teilhard de Chardin's Law of Complexity-consciousness, that when some threshold of neural complexity is crossed, there comes into being a level of conscious functioning that has the capacity to *reflect* upon itself. This ability of the intellect can impose order, law, correlation on the underlying flow of psychic contents, and that in turn, upon the patterns and processes of the neural substrate, which then acts upon the biological organism, its physical and chemical processes.

In fact a theory under much debate in scientific circles, the anthropic principle in its weak and strong forms, holds that the fundamental processes of the universe must be such that it gives rise to human consciousness, that which can observe it, reflect upon it.

In considering the fundamental nature of human consciousness, one is seeking to explain that in which explanation occurs, to explain that, which, merely as part of its output gives rise, for example, to the most highly esoteric speculations of theoretical physics. If this latter involves formidable levels of abstraction and many years of preparatory training, one might well be aghast at the prospect of even attempting to assimilate the nature of that which does it! Words are apt to signify so vast a range of possible meanings as to become virtually meaningless. However, the great problem is that to grasp the nature of the various "parts" that enter into human knowing, and what empowers it, one must have some sort of overall grasp of how they come together to form a whole, some sort of complete functioning unit. How in fact can one grasp the nature of that which can potentially "know and become everything"?

The topic is introduced through a metaphor for human consciousness and what goes on in it, through the preliminary notion of a "human spacecraft." To operate such a "vehicle" successfully on its "journey" through life, one must have a practical grasp of how to make it function properly.

An initial cursory reflection on one's own conscious activity reveals three basic notions. Firstly, there are certain fundamental *operations* that one performs upon the imagery provided by the incoming data of our external senses (what is given through acts of seeing, hearing, tasting, smelling, touching). These operations, which may, or may not be performed, involve an initial level of attending, higher levels of questioning (yielding possible answers, insights, explanations), of judging (whether these answers are true or false) and deciding (selecting a possible course of action). Secondly, there is some *content* to each operation (e.g., one can't see without seeing some content). Thirdly, there is some entity, an *operator* that decides whether an operation shall be carried out or not. This all seems perfectly straightforward. In fact if you accuse someone

of being inattentive, unintelligent, lacking in judgment, indecisive, you are likely to evoke a lively response!

Thus, to a first approximation one might envisage the operator in the craft, before the instrument panel, confronting the vast and complex flow of incoming feeling-evocative sensory data on the display, directing this or that "event sequence" into the operational computer, scanning the output, applying verification procedures, evaluating and storing the data and results in the vast memory banks of the brain. The more diligent the operator is in applying the operations, the greater will be the level of knowledge attained, the more efficiently can the operator deal with the exigencies, the problems, the needs of day-to-day living, and act responsibly.

If this description of the manner in which the "operator" of every "human consciousness" relates to the incoming data of sense, is both plausible and graphic, by the same token it involves an enormous over-simplification. In fact, the "operator" has been applying both to the "spacecraft" and "operator" what it has been doing to the incoming data of sense! It has been thinking about, and knowing, its own thinking and knowing!

The next step in "upgrading the metaphor" requires careful attention to that aspect of human consciousness that renders it unique, the most significant evolutionary development in the known universe. That is its capacity to *reflect upon itself*, to turn back on itself, *to possess itself*, *to determine itself*, a self that remains one and the same from its inception, but changes qualitatively.

A graphic illustration of this capacity is afforded by some results obtained by a neurosurgeon, the late Wilder Penfield (1975). In a search for sites giving rise to epileptic seizures, the exposed brain tissue of the patient, under local anaesthetic, was locally stimulated by the application of a small electrode. In a number of cases it was found possible to produce total recall of events attended to in an earlier stage of the patient's life, recognized as his or her own. There occurred a sort of "dual consciousness" in which the patient could respond to questions from the surgeon while being "present" at some earlier circumstance

in life. The electrode could bring about recall, could produce bodily movements, but could not bring about the fundamental operations of the mind, of directing attention, questioning, judging, deciding. That could only be done by the patient (the operator) in response to a request from the surgeon with respect to the electrically induced reappearance of the past record. It would thus appear that, as the operator can experience, understand, judge, decide, the resulting contents become a fixed temporal disposition, a stance of the same, but qualitatively changing the operator in the present. That which has happened cannot "un-happen," is now part of the *self-assembling operator*, now an *ineradicable element* in the working out of the universe, with all its evolutionary history, future possibilities, that cannot un-be, un-happen, that is somehow all interconnected, all interrelated (Davies, 1988).

There is some entity that is uniquely me or uniquely you, that comes into being, develops, self-assembles. That same "me" that was there before entering into a deep sleep is still there when one awakens. Even more remarkable and numerous are reported instances of "clinical death." In fact a recently reported case on a popular television series notes the chilling and removal of the blood from a patient suffering from a brain aneurysm, resulting in all the symptoms of clinical death, flat traces on the EEG and ECG monitors, etc. The deflated brain aneurysm was removed and the patient resumed a normal healthy life. During the "clinical death" the patient reported further experiences similar to those commonly recounted elsewhere, tunnel experience, sense of peace, etc. Though not conclusive in terms of total independence of mind of its physical substrate and associated quantum activity, it is supportive of the basic thesis that what comes into being when a certain level of neural complexity is reached, can exist independently of that substrate, the physical elements of which are in any event, persistently being replaced. One carbon atom will do as well as any other.

Other interesting results concerning the extraordinary nature of mind-body relationship have been reported in connection with studies on phantom pain and the strong sense of the real presence of a limb that had been amputated, or even missing at birth (Melzac, 1992), also with respect to phantom seeing

and hearing; "The brain does more than detect and analyze inputs; it generates perceptual experience even when no inputs occur. We do not need a body to feel a body."

At the heart of the evolutionary process in the universe appears to be the multifaceted, omnipresent, empowering notion of energy driving systems that use up energy, dissipative systems, which can attain higher levels of complexity, organization, schemes of recurrence, thereby opening up whole new realms of unpredictable possibility. How does the notion of energy relate to the "human spacecraft"?

At the biological levels of vital process the system is sustained by conventional *energy* sources, ultimately deriving in large part from the thermonuclear reactions in the nearest star. However, when dealing with objects present in consciousness at the higher operational levels, the fundamental *empowerment* is associated with the *empirically determinable feeling responses*, in particular with respect to objects being attended to in consciousness. Deep within us all, emergent when the noise of other appetites, tendencies, desires, is stilled, there is a drive to know, to understand, to see why, discover the reason, find the cause, to explain, to become. Too often such a drive is vitiated by elementary or primitive feelings in personal matters.

In general, two main classes of such "empowering" feelings, that constitute responses to objects, may be distinguished. The first is concerned with bringing about the agreeable, the pleasurable, the satisfying while excluding their alternatives. When exclusively emphasized, there is a drive to have, own, possess, control, or at least render recurrent objects that can bring about such agreeable feeling responses, while avoiding, eliminating as far as possible, anything that would make demands, involve striving, making an effort, involve one in the disagreeable. There results a tendency towards self-centredness, self-confinement, boredom, emptiness, the tension of unused capacities. There is a persisting demand for some succession of objects, apt to become increasingly inappropriate and unrealistic, that will provide amusement, diversion, distraction.

There are, however, other objects that give rise to a very different class of feeling responses to objects present in consciousness, which involve awareness of something truly good in itself, something truly worthwhile, that warrants our making every effort to bring it about, abandoning short term satisfactions for something of much greater significance. In short, there are objects which are intrinsically good in themselves, that evoke within us *value* responses. There is a movement towards *transcending*, of moving beyond the boundaries of self; a sense of being released from the tension of unrealized potential, a movement towards a deep set "joy at being in the presence of." There is a disposal towards commitment. *Thus the human subject realizes itself as the intelligible unity in the multi-dimensional manifold of the conscious events of a lifetime*.

If the whole universe seems to be oriented towards some overall purpose, goal, end, there arises the question as to what is being accomplished, individually over a particular lifetime, collectively over many lifetimes that have been, that are, that will be. Thus we are confronted by the role of consciousness in the universe, the nature of the space appropriate to our "human spacecraft." The nature of that space may be inferred from the unrestricted intention of the "on-board" operations. Thus, the operator, while remaining one and the same, is qualitatively changed by the contents of the operations, which are accumulative and progressive. All we know is somehow with us; it is present and operative within our knowing (INS, p. 278). There is an aggregation, a coalescence, a growing unity "glued together by insights," a lived *meaning*, attained up to this particular moment. Much of that meaning is "detachable," can be passed on to other "craft," disseminated, stored for future reference.

Thus, there is a publicly attested-to, self-correcting, rapidly expanding, world of meaning. (For example, every satisfactory use of a city street map verifies its authenticity.) This world of meaning can enormously enhance the "operational range" of the individual "craft." The operations are not limited merely to the *immediate*, incoming data of sense, nor just introspectively with regard to associated operations, contents and feeling responses. The operations can be applied *mediately* through access to the incredibly varied contents of this much

vaster world of collective meaning, with respect to what is absent, or in the past, or in the future, to what is merely possible or ideal.

It would thus appear that as the titanic energy reserves of the universe dissipate, as the entropy of the system rises, its disequilibrated thermodynamic systems can simultaneously generate higher and higher levels of complexity, schemes of recurrence, the total *information* content of the universe which includes not merely that which is capable of being understood but also new realms of emergent possibility, are also rapidly expanding.

At the highest known level of complexity is the human operator, which can understand, attain insight into not only its surroundings but also itself, which can *self-assemble*, and influence future development by attaining higher and higher levels of meaning. Where such meaning is derived through full employment of the operations, there is *progress*; on the other hand, where there is failure to employ the operations, and recourse only to short term self-defeating activities, there is *decline*.

The categories of feeling response, the merely subjective search for pleasure and avoidance of pain, in contrast to the much deeper imperatives of feelings that constitute responses to value or the truly good in itself, appear to involve a built-in tendency to self-correction. On the one hand, failure to implement the operations, on some time scale, generates *negative feedback*, the suffering, pain, the troubled conscience, which eventually urges some refutation or revision of unsatisfactory performance. Genuine striving for the truly good, on the other hand, sooner or later generates *positive feedback*, the rewards of true progress and development, the ease of good conscience.

It would appear that the fundamental orientation of the human operator is towards knowing and becoming everything. Such an outcome would consist in everything that can be known, all that is known together with all that remains to be known, everything that *is*, whether it *is* in the past, *is* in the present, *is* in the future. It is the "space" appropriate to the "human spacecraft" or the human operator.

What limit can be set to the process? Presumably if the human operator participates, as it were, through the operations in this space, in being, in assembling bits of true understanding, in communally solving the puzzle of the universe, the limit will involve the totality of correct answers to all coherent questions including the question, "Who am I?" Some entity that understands itself must constitute the originating ground and end towards which all existents are attracted. Perhaps the biblical answer to the question is as far as we are going to get, at least at this stage of development, "I am who am." Insofar as one grasps the norms of one's own mental procedures there arises a question as to the possibility of interacting with this mysterious entity that seems to be at the bottom of it all; the mind becomes *religious*. Authentic religious experience spontaneously manifests itself in changed attitudes, love, joy, peace, kindness, goodness, fidelity, gentleness, self-control.

This would seem to be an aspect of the world's major religions in their positive moments. "Eastern religion stressed religious experience, Semitic religions stressed prophetic monotheism, Western religion cultivated the realm of transcendence through its churches and liturgies." (M, p. 114) "The wars of religion provided the evidence that man has to live not by revelation but by reason." (INS, p. 231) The role of *self-realization* is emphasized by William Johnson in *The Mirror Mind* as furthering mutual comprehension in *interreligious dialogue*. He further emphasizes Lonergan's analysis in the context of distinguishing the authentic from the unauthentic in mystical experience. Genuine religion has to be discovered and realized by redemption from the many traps of religious aberration. In Lonergan's words, "human development is not just in skills and virtues but in *holiness*. The power of God's love brings forth new energy and efficacy in all goodness and the limit of human expectation ceases to be the grave." (M, p. 116)

Reference was made above to Lonergan's development of a unique vocabulary. The great problem with using words to describe that which gives rise to words is that conventional dictionary definitions tend to involve recurrence of a few

terms without any clear delineation of the relations between them (e.g., mind is the seat of thought; thinking is an exercise of the mind!).

In the ensuing development, though the words have meanings which are for the most part familiar, it is crucial to clarify the distinctions and relations using one's own experience. A particularly useful exercise is to generate stories which illustrate distinctions in meaning, whether in the context of "knowing" or in the context of "knowing and feeling."

The notion of the "self-assembling human spacecraft", or "pneumochip", includes as a single unity, operator, operations, contents, both in the aspect of their coming about and being retained.

Thus, Chapter II identifies the fundamental notions of operator, operations and contents from the first moment of consciousness, the subject/object, me/ not me division. Chapter III on intentionality analysis initially emphasizes cognitive process, how we come to know. The operations are identified in terms of the fundamental tension between subject and object. Though words are being used to denote basic concepts, emphasis is first placed on what occurs in the mind prior to its expression in words, and then on its expression. Attention is then directed to the role of feelings, in particular to the distinction between mere likes/dislikes and value responses, both individually and in relation to others. In Chapter IV the developments that result from applying the basic principles of authentic operation are presented. Thus cognitive and affective elements in the conscious stream coalesce to yield grounds for authentic decision. Chapter V addresses the topic of what is being accumulated "on board" in terms of meaning and of the changes in overall feeling states, the conversions that result from authentic operation. Chapter VI extends these considerations briefly into the context of the individual and community. In Chapter VII, human consciousness is located in the overall context of world process. (This chapter is not essential to grasping the significance of the transcendental precepts in a practical context and may be omitted if desired.) Chapter VIII is concerned with breakdown, the failure to operate authentically. Chapter IX outlines the nature of recovery, of healing and redemptive process. In Chapter

X, there is developed an ethics, a science of what ought to be and of what ought not to be that arises from these considerations, also the role of prayer in winning a freedom that is effective in bringing about authentic development. Chapter XI presents the relevance of these ideas to the problems of our times.

Lonergan insists that the analysis of one's "mental apparatus" must be verified in the context of one's own experience, for example, the symbols that are important, the use of thought experiments to clarify distinctions, metaphors to narrow the gap between words and the immensities that are signified. I have included elements from my own personal journey as illustrative of the sort of thing others might look out for in the context of their own experience.

Throughout the text, frequent references are made to Lonergan's original writings. These are introduced in two different contexts.

A first context employs direct quotations and are thus denoted by quotation marks.

A second context, though often employing Lonergan's own words, involves juxtapositions or arrangements of ideas that I found particularly helpful in assembling my own "working model." The primary intention here is to indicate where these ideas are located in original texts.

The bibliography includes, not only material referred to in the text, but also reading which I found of assistance in developing Lonergan's analysis into a worldview appropriate to our time.

In the glossary of terms, with occasional self-evident exceptions, quotation marks are not included since the material is taken directly from the sources quoted. Again, selections are based on what I found helpful in establishing for myself a coherent "model." Self-appropriation involves acquiring what is proper to oneself. This includes a coherent vocabulary expressing, not only what is happening in our evolving universe, but also, both individually and collectively, the origins of the evolving and affectively-laden meaning within ourselves.

II. FUNDAMENTAL NOTIONS

"The human mind is ever the same, but the techniques it employs develop over time." (PGT, p. 1)

2.1 SUBSTRATE

Life as we know it would not exist at all unless it had been able to evolve from simple origins to its present level of complexity. "Subatomic particles somehow enter into the elements that enter into the periodic table; these chemical elements enter into compounds, compounds into cells, cells into the myriad combinations of plant and animal life." (3C, p. 24) It has been proposed by Teilhard de Chardin (1955) that as the evolutionary process is directed towards higher degrees of complexity or organization, there is a movement towards correlatively higher levels of consciousness. Evolution, having crossed a critical threshold marked by the appearance of life, continues at an accelerating pace in the realm of living things. Another critical threshold was crossed with the emergence of human consciousness. It would thus appear that when some level of neural complexity is reached, there is initiated a crucial distinction between the "me" and "not me," between subject and object. There has come into being an entity that can be present to itself, think about its own thinking, that has the capacity to know knowing, and know that it knows, a human spirit capable of self-possession through self-awareness and self-determination. When this actually comes about cannot precisely be determined. However the interval of time within which it occurs is likely to be significantly reduced by recent developments in neuroscience. "Patterns of change in the optic nerve and the cerebrum lead to corresponding acts of seeing. What is true of sight is true of the other outer senses and though the matter is far from being fully explored one may presume that memory and imagination, conation and emotion, pleasure and

pain all have their counterparts in corresponding neural processes and originate from their demands." (INS, p. 190) In a recent article (Fischbach, 1992) it is noted that the future of cognitive neuroscience depends on our ability to study the living human brain. Positron emission tomography and functional magnetic imaging hold great promise in this regard.

2.2 OPERATIONS

The most complex and extraordinary object in the known universe is human consciousness. Its activity carries with it no direct information on its accompanying neural embodiment. That can only be obtained through sophisticated instruments whose outputs come in through the senses. The "psycho-event" and the "psycho-neural event" are complementary in Bohr's context. That is, independent and mutually exclusive methods of observation are necessary to account for the relationship of mental events and neural events (Globus, 1973). There would appear to be a certain prescience in the lines of Alexander Pope written in the early 1730s:

"Like studying life through creatures you dissect, You lose it in the moment you detect."

Nevertheless to the human subject, the data of consciousness are just as accessible as the data of the senses (*what* is seen, heard, etc.), and on their basis, we can proceed to study the data of consciousness (the seeing, hearing, etc.), its operations and their objects and thus objectify the terms and relations concretely given to us in the awareness that consciousness is (F.E. Crowe, personal communication).

Consider the difference that occurs when one opens one's eyes:

- 1) There is an *operation* seeing.
- 2) There is an *object*, namely that which is seen. One cannot see without seeing something.

 There is an *operator* – a human subject – that wills the operation to occur.

Note that while the seeing is occurring, taking place, is in act, that which is seen is also in act. The same applies to hearing, touching, smelling, tasting, giving rise in general to the *data of sense*.

There are also the *data of consciousness* – operations at the level of:

- EXPERIENCING seeing, hearing, touching, tasting, smelling, remembering, imagining and perceiving.
- 2) UNDERSTANDING inquiring, conceiving, formulating.
- 3) JUDGING reflecting, weighing the evidence, affirming or denying, evaluating.
- 4) DECIDING reflecting, deliberating.

Consider that which comes into being:

- There is some entity, of the nature of pattern, order, information, that perdures, "remains permanent," throughout a human life as the physical, biological substrate is constantly changing.
- 2) Thus there is some entity that "stands alone, exists in itself, stands outside its causes," as it were, perdures, a subsistent in an intellectual nature that defines the concept *person*.
- 3) A human subject is a conscious person.
- 4) *Consciousness* is an awareness immanent in cognitional acts awareness of *self*, and the activity of the self. (One is conscious of a sneeze, aware that the window is open.)
- 5) The *self* is a concrete unity, identity, whole in data characterized by the operations.

Consider that which develops:

1) Over the course of a lifetime, as the biological substrate comes into

16 ♦

being, flourishes, declines, dies, there is accumulated some aggregate of materials of the nature of pattern, information, once conscious, once objectified, the record of conscious activity of the "self-assembling" human subject, the "becoming" of that subject. It cannot be "unassembled" – it has become part of that totality of events, related by intelligibility, that constitutes the working out of the universe.

- 2) At any instant over a lifetime, there is a disposition, stance, outlook, that is determined by the previous record of materials once objectified.
- 3) If one is attentive, intelligent, reasonable and responsible, there can occur a growth in understanding, authentic affectivity, awareness of the truly good, a growth in meaning life can become more and more meaningful rather than more and more meaningless. As consciousness is raised from experiencing, to which knowing at the animal level is confined (sense, memory, imagination, emotion, "trial and error" or "hit and miss" problem solving), to the levels of understanding and judging, of encountering truth, and also in terms of feeling responses, there can emerge the truly good, which furnishes the elements for deciding, and for actions based on value.

Over time there accumulate acts of meaning – and access to new levels of understanding and feeling states, that generally progress over life – that constitute conversions, intellectual, moral and religious – a quite literal falling in love with a mysterious uncomprehended God and His creation. These are discussed in Chapter V.

There is thus required a certain conscious orienting, directing, aiming towards an object, that is an *intentionality* which has an appropriate partial object at each operational level.

III. INTENTIONALITY ANALYSIS

"Intending then is comprehensive. Though human achievement is limited, still the root dynamism is unrestricted. We would know everything about everything, the whole universe in all its multiplicity and concreteness." (2C, p. 124)

3.1 DRAMATIC INSTANCE

In the ensuing development, it is crucial to attend to elements in one's own thinking so obvious and familiar as usually to pass unnoticed. However, the great problem of our day is the fragmentation of knowledge into a profusion of exclusive specialties devoid of any overall coherent worldview. Yet it all starts out with human heads solving problems.

Consider a simple example. On a wild night of wind and rain, while driving along an isolated mountain road, a front tire goes flat and one is understandably exasperated and upset. Still, there is at least a spare, so with much fumbling about in the dark one installs the jack and removes the wheel nuts carefully storing them in the removed hub cap. Now wet, cold, and thoroughly disgusted one trundles the spare wheel around, accidentally kicks the hub cap, wherewith the crucial hub nuts vanish down an unnoticed storm drain. Chilled, furious, frustrated – "God, why should this happen to me?" – one is faced with the prospect of a damp cold night, miles from anywhere until some sort of help arrives. On the other hand one could try and think up some solution. There isn't any unless one could get some nuts from somewhere. Then there is a flash of insight, a surge of elation. The insight is the click, the grasp, what is added to

one's thinking, a sense of "this must be the answer" in this situation. Take a nut off each of the other wheels!

Still, will the car be safe to drive? One makes a judgment based on the available evidence – "Yes" – provided one doesn't overstress the system by excessive speed. Given the circumstances, there is little need to deliberate as to whether the proposed course of action is truly worthwhile or not! Clearly it is in one's best vital interest to get out of there before something else goes wrong. From now on, one knows what to do about such a situation should it occur again.

The insight has passed into the habitual texture of one's mind. It is important to advert also to the profound change in feelings that occurred in the course of the entire episode. If one did a lot of driving in remote areas, it would be prudent to acquire the relevant mechanical skills, spare parts and a radio to summon assistance.

The great problem with life's journey is that we have to live it before we have the necessary skills to do so. But then, that, perhaps, is why we are here, on the job "training" for some sort of role in "cosmic hyperspace"!

This does not mean that the required skills are unknowable, simply that we have to make the effort to acquire them, to handle with confidence the most remarkable entity in the known universe, introduced under the contemporary metaphor of "the human spacecraft."

3.2 INTENTIONALITY

As noted above, there is a first moment of consciousness in which the division between subject and object occurs, between the "me" and the "not me." There is a presence of the subject to himself or herself, the incredible capacity to reflect upon one's own conscious record. There is posed a fundamental tension between what one is and what one ought to be. This tension is not confined just to development on the cognitional side, to a world defined by the pure desire to know, but also to development of *spontaneity of feeling*, the education

of feeling. Apart from times of dreamless sleep, one is performing intentional acts, if only at an elementary level.

Table 1 summarizes the four operational levels and what is intended at each level.

At the level of:

| EXPERIENCING | there is an: INTENDING which is an attending to or making present DATA (selective rather than creative) also an IMAGINING which makes PRESENT an IMAGE either PERCEPTUAL (representative in the light of past sensory inputs and understanding, etc.) or FREE (not necessarily corresponding to anything that exists) (Note: creative aspect in facilitating INSIGHTS – also link to depth psychology.) |
|---------------|--|
| UNDERSTANDING | there is an INTENDING which makes present an INSIGHT (Note: INSIGHT giving rise to CONCEPT ABSTRACTS as much of the IMAGE as is required). |
| JUDGING | there is an INTENDING of the TRUE, the REAL. |
| DECIDING | there is an INTENDING of ACTION to be taken. |

Table 1 - Intentionality

The fourth level is responsible for proper functioning at the first three levels and results from a synthesis of cognitive and feeling aspects worked out on the earlier levels and that come together in answering the question "is this really worthwhile?" Note that the term "will" refers to this capacity to make decisions. Willingness is the state in which persuasion is not needed to bring one to a decision. Willing is the act of deciding.

In general, the *subject* (everything that makes you what you are at this moment)

intends the object (everything that can be attended to, imagined, questioned, judged, decided). In the foregoing, words have been used to describe that which gives rise to words. As noted above, data include data of sense and data of consciousness. "The direct mode of cognitional process begins from data of sense, advances through insights and formulations to reach reflection and judgment. On the other hand, the data of consciousness consist of acts of seeing, hearing, tasting, smelling, touching, perceiving, imagining, inquiring, understanding, formulating, judging. Thus the three levels of the direct mode of cognitional process provide the data for the introspective mode; as the direct mode, so also the introspective unfolds on three levels, an initial level of data, a second level of understanding and formulation, and a third level of reflection and judgment." (INS, p. 274) ("...introspection may be understood to mean, not consciousness itself but the process of objectifying the contents of consciousness." (MIT, p. 8))

In the following development, first the cognitive and then the corresponding affective aspects will be presented. For clarity of presentation a simple box diagram is used to represent the cognitive operations and their contents. The diagram is retained and extended as further elements are added until there can be depicted the basic lay-out of the "human spacecraft," operations, feeling-laden contents, "on-board" storage accumulating contents, of meaning achieved and overall major changes of attitude, disposition, stance, outlook that can occur in the course of its temporal journey, the conversions.

3.3 COGNITIVE ACTIVITY PRIOR TO EXPRESSION

Attention is concentrated on the first three levels of Table 1, These levels are displayed in Table 2 and are considered initially with emphasis on one's conscious mental activity *prior to its expression using words or signs*, even though words are employed in its description.

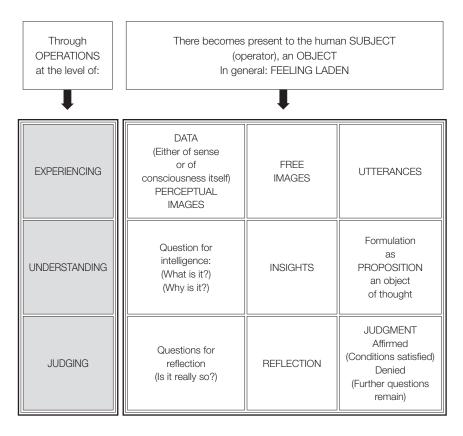


Table 2 - Cognitive Process

A) EXPERIENCE

A datum of sense may be defined as the content of an act of seeing, hearing, touching, tasting, smelling (INS, p. 73). The data of consciousness consist of acts of seeing, hearing, touching, tasting, smelling, perceiving, imagining, inquiring, understanding, reflecting, judging (INS, p. 274).

A sense image is a conscious experience which reflects the conditions of the external world according to the abilities of each sense (BB, p. 66).

In general an image is the content of an act of imagining. We form images to form some sort of apprehension of what is possible (UB, p. 179).

The flow of sensations, as completed by memories and prolonged by imaginative acts of anticipation becomes the flow of *perceptions*. It is of the latter perceptual flow that we are conscious, a sort of "running plot" of our immediate circumstances. It is only when the perceptual flow goes wrong that mere sensation bursts into consciousness, for example, in the experience of trying to go down another step when one has reached the floor (INS, p. 73).

B) UNDERSTANDING

As noted in the preface, the act of understanding, of having an insight, finding a possible answer to a question, plays a central role in these considerations. The role of question here denotes a fundamental attitude of the inquiring mind.

Insight is that which:

- 1) comes as a release from the tension of inquiry,
- 2) comes suddenly and unexpectedly,
- 3) is a function not of our circumstance but inner condition,
- 4) pivots between the concrete and the abstract,
- 5) passes into the habitual texture of the mind (INS, p. 3).

An insight is correct when there are no further relevant questions (INS, p. 284).

An insight, an act of understanding is a matter of knowing a cause (V, p. 14).

Accumulating insights are *higher integrations* of otherwise coincidental manifolds of images or data (INS, p. 451).

Insights are not intuitions. They are not of themselves what is really so. Of themselves they merely grasp what may be relevant to what one is imagining and, if one's imagining is sufficiently accurate, to an understanding of what is so (2C, p. 274).

Just as wanting an insight penetrates below the surface to bring forth schematic images that give rise to the insight, so *not wanting* an insight has the opposite effect of repressing from consciousness a scheme that would suggest an insight (INS, p. 192). There cannot be selection and arrangement without rejection and exclusion and the function that excludes elements from emerging in consciousness is now familiar as Freud's censor (INS, p. 190).

What is grasped in insight, is neither an actually given datum of sense nor a creation of the imagination but an *intelligible organization* that may or may not be relevant to the data. The intending that is *conception* puts together as much of the image as is *essential* to the occurrence of the insight (M, p. 10).

The two most important concepts involve the notions of "thing" and "relation." If we knew every-thing, the relations between the parts of each thing, as well as the relations between all things we would know "being," the totality of correct answers to all coherent questions, everything about everything, everything that would survive in a definitive explanatory account of the universe. Each thing distinguishes itself from no-thing only insofar as it possesses existence.

The notion of a "thing" comes about when, in a stream of individual data, there is a single whole, an intelligible unity, an identity that unites what in space is here and there and in time is then and now (1C, p. 161). This, of course, brings up the problem of how something can change and yet stay the same, for everything in our universe, and especially oneself is in a state of change. The answer is that for a given thing, certain aspects remain the same while other aspects change. Thus, a solid "substance" such as one's front door may undergo many "accidental" changes such as colour or fittings, being open or shut. Just as knowing a thing consists in grasping a *unity identity whole* in individual data, so knowing *change* consists in grasping the same identity or identities at different times in different individual data. If the same thing exhibits different individual data at different times, it has changed (INS, p. 282).

Thus for example, one summer afternoon when my father, who had been painting the exterior of the house, left the ladder unattended, the challenge to an

eight-year-old proved irresistible. When my small head appeared in the open upstairs window, my Aunt Aggie, who was seated on the toilet, underwent a dramatic change of affective state, from reflective calm to transfixation in horror, without her actually becoming another thing!

The definition of a thing can equally well be applied to the data of consciousness. Thus the self is a thing, a concrete and intelligible unity – identity – whole characterized by such occurrences as sensing, perceiving, imagining, inquiring, understanding, formulating, judging, deciding, which are every bit as real as your living and your doing.

The concept relation is the reference of one thing to another, two correlatives, a base and a term, and also a foundation. Thus in the relation fatherhood, the base is the father, the daughter is the term, and the foundation, which is the act of insemination, is in the father. On the other hand, in the case of two friends the foundation can exist in both, or indeed, reside in a multiplicity, such as the many parts of a clock (BB, p. 344).

One cannot misunderstand what one imagines; misunderstanding is the fault, not of intelligence, but of imagination which can exhibit what is not and can fail to exhibit all that is; hence, when we attempt to correct a misunderstanding, we point out what we think is misrepresented or overlooked by imagination, and when we acknowledge a misunderstanding, we add that we had not adverted to this or that (INS, p. 407).

C) JUDGMENT

"Insight consists in a grasp of possibility. Thus experiencing and understanding alone do not suffice for an instance of human knowing, there must be added a further act of judging. To omit judgment is quite literally silly; it is only by judgment that there emerges a distinction between fact and fiction, logic and sophistry, philosophy and myth, history and legend, astronomy and astrology, chemistry and alchemy." (IC, p. 223) The evidence for a judgment is found in what we experienced. Without judgment there is merely guesswork.

Judging is answering "Yes" or "No" to a question for reflection, "Is it so?" or "Is it not so?" The conditions for an affirmation are to be found in the data. There remain no further relevant questions that might complement or change this particular insight. What is determined is *real* for it is bound up with one's living and acting and is just as real as they are (M, p. 275).

Meaning is a product of the mind. Each *true* judgment is but an increment in a whole named knowledge. The meaning of the judgment is but an element in the determination of the universal intention of being, which includes everything that can be known about everything. However, judgments can also be *false*. In this case it means not what is, but what would be, were it not false but true. There can be instances of false meaning.

Experience, understanding and judgment are not three knowledges but one knowledge of a thing under three aspects (CLI, p. 177).

For those who, like the writer, when confronted by a trick question, find deep suspicion a prelude to mental paralysis, I must apologize for posing the following by way of illustration. If a bottle and cork cost \$1.10 and the bottle costs \$1.00 more than the cork, what is the cost of the cork? The first answer might be \$0.10. At the level of judgment the answer is checked against the data of the original problem. If the cork cost \$0.10 and the bottle costs \$1.00 then the sum of the two is \$1.10. This would, however, mean that the bottle costs \$0.90 more than the cork. The answer does not satisfy the conditions in the problem.

Let us make another attempt, namely that the cork cost \$0.05. In this case the bottle costs \$1.05 and the bottle and the cork cost \$1.10. Further, subtracting the cost of the cork from the cost of the bottle, the difference is \$1.00. The conditions have been met, there are no further questions, and an increment of truth for this particular data set has been achieved.

It may be helpful to contrast what has been said about human knowing with conscious activity in the animal. Animals live largely under the influence of their subjectivity and are guided by common sense. The stream of consciousness flows in the biological pattern and is a higher technique, in the scale of

complexity, for attaining biological ends. There is an extroversion in which present data are distinct either from the memories that enrich them, or imagined courses of action. The extroversion is concerned with the real; thus, for example, a kitten might be attracted by a realistic painting of a saucer of milk, might investigate, sniff, perhaps try to lap; but this could not lead to lapping, and still less, to feeling replete; for the kitten, painted milk is not real (INS, p. 251).

3.4 COGNITION WITH EXPRESSION

The benefit in employing the intentional levels of consciousness is clear enough in their applicability to what one might term situations, conditions in which we find ourselves, of being attentive, intelligent, reasonable and responsible. It is, however, highly desirable to extend these notions to include the way in which words come about in human heads, particularly in view of the rapidly escalating flow of verbal communications in today's world. The emphasis here is on grasping the fundamental notions in terms of the mind's ability to explore far beyond its "matter interface." In reflecting on instances of its doing that, it can turn its remarkable abilities upon itself and know its own knowing! There emerges the notion of a sort of "self-assembling pneumochip" with an activity that is both progressive and accumulative. This combines the notion of spirit and the notion of chip in an analogous context appropriate to today. The spirit denotes an immaterial being capable of self possession through selfconsciousness and self-determination, and is capable of grasping supra-sensible values. Microchip denotes a small piece of semi-conductor capable of carrying electronic circuits (e.g., operations and accumulative contents that result). It is within its knowledge of the universe that knowledge of itself is attained, knowledge of its function in the universe is acquired and grounds for willing the execution of that function is provided (INS, p. 515).

It is not just sufficient to discover some solution to a problem, it must be *expressed* adequately. Otherwise one will have had the mere experience of a bright idea, but one will not have the power to recall it, use it, apply it. Some sensible

expression is intrinsic to the pattern of our conscious and intentional operations (3C, p. 142). The expression renders not just the figurative representation of the object, but the *idea* of the object to be present in consciousness (BB, p. 218). (Note that, roughly, "idea" means the first easily perceptible appearance of a thing according to its characteristics and then, especially, the inner nature revealed through them.) The *concept* follows the judged existence of the thing and copies that nature (BB, p. 184).

The *concept* arrived at in the course of these operations of the mind can be expressed by a *word or sign*. Language is a set of such conventional signs. These can be multiplied almost indefinitely, differentiated and specialized to the utmost refinement. Words denote not only what is present but also what is absent or past or future, not only what is factual, but also what is possible, the ideal, the normative. How does language come about, express the meaning arrived at through the operations given in consciousness? For practical purposes, the fundamental ideas may readily be introduced in terms of how we might apply the operations to something encountered by our external sense, some data of sense.

Initially, in the incoming stream of sensory *images*, some *thing* "stands" out from its background, attracts our attention, gives rise to the question "what is that thing?" Through an act of understanding or an insight there is grasped some concrete unity, identity, whole in the data being received, a *concept* which can be judged to exist. It is a unity because every aspect of its data belongs within that unity. The unity involves extension in space, duration in time. It possesses an identity, can be distinguished from other things, remains essentially the same though some of its properties may change. The concrete unity embraces some totality of aspects, is a whole. To say this apple is red is to conceive a unity in some totality of its aspects, to select some aspect out of that totality and to attribute the former to the latter. The Latin root of the term "concrete" implies "grown together." Being, the object of the pure desire to know, a single knowing that has three parts corresponding to the three operational levels of experiencing, understanding, and judging, is absolutely concrete. *Truth* is this conformity of mind to the thing. One has attained an instance of what

Lonergan calls a "virtually unconditioned." That is, for practical purposes, the conditions for this thing to be true have been fulfilled at the levels of experience and understanding and warrant affirmation at the level of judgment.

An important distinction exists between the image and the concept. The concept denoted by the word "weapon" is completely distinct from the imagery to which it applies. The concept is, as it were, surrounded by a "swarm of images: swords, pistols, missiles, etc." Given a sufficient vocabulary of words, a definition might be constructed such as, "a weapon is an instrument for causing bodily harm." If queried as to the meaning of the word, one could start by listing such images as might already be familiar to the questioner. This could be elaborated by further concepts, also already familiar, to reach a definition.

Through insight, a concept is "drawn out" of the imagery presented by the senses. Through other insights, other concepts may be employed to provide a tentative *definition* of the thing. Through judging, this definition may be affirmed of the original concept. This may be illustrated by a simple example summarized in the following table.

| OPERATION | CONTENT SIGN | | |
|---------------|--|---|--|
| EXPERIENCING | Sense data – image | | |
| UNDERSTANDING | ldea or Concept | Word or Term (for example, "apple") | |
| UNDERSTANDING | Group of concepts (definition) | Group or words, say, "edible fruit" | |
| JUDGING | Affirming or uniting the concept with the definition | Proposition, say, "an apple IS an edible fruit" | |

Table 3 - Expression of Definition

This might be elaborated as follows. Some observer, encountering an orchard for the first time, forms a concept from the visually imaged objects hanging from the trees, expresses it in a word, say (for convenience) "apple," and affirms its existence at the level of judgment. From knowledge based on an intellectually patterned experience of objects that successfully meet the need hunger, the observer has already abstracted a concept and denoted it by the word "edible." Other instances of the product of plants and trees have given rise to the concept "fruit." Instances of the successful ingestion of some "apples" leads to the final proposition. Others, grasping the concepts denoted by the words, can readily grasp the meaning involved, say, for example in a survival manual. Thus there is a *circle of insights into terms and relations*. (Basically a relation denotes the way that one term refers to another.) A final insight fixes the circle. If judged correct, it is an answer to some such practical question as, "what is that thing?"

In this single instance of knowing three components are involved. At the level of experiencing there is a *potential* component, the "hanging objects," with their own level of development already achieved, a *formal* component, that makes possible the distinguishing and relating of the concepts involved, and an *actual* or full component, affirmed in the proposition.

Through the accumulating data base and questioning of many observers there is arising a vast multiplicity of concepts and propositions associated with the structure, genetics, classification, distribution, and economics of apples and the plants that give rise to them. In the correct affirmation of what something IS, we have acquired an increment of *proportionate being*, that level of being which can be attained by human cognition. One has attained an instance of the "virtually unconditioned." That is, the conditions for some affirmation at the level of judgement are found at the levels of experiencing and understanding. Further increments are, of course, anticipated through the broad collaborative advance in scientific knowing in its many aspects. (It is of interest to note in passing, that scientific knowing is concerned with relating things to one another as distinct from common sense knowing which is concerned with relating things to ourselves.)

These considerations are absolutely central to the authentic functioning of the "pneumochip," to its doing that which it came about to do at this level of a universe which is evolving to ever higher levels of complexity and functioning. It is affirming that something IS and also something about WHAT it IS! It is, through its operations, powerfully oriented towards "IS-ING," or rather, the more grammatically palatable "BEING," to attaining the totality of correct answers to all possible questions, past, present and future. The results of its efforts become part of itself and can, of course, include the results of its inquiries into the nature of its own activity, affirming its own existence and, indeed, the nature of that existence, at least for the very practical purposes of an efficient and increasingly exciting "self-assembly"! There are many subtleties to this notion of being, that which is coming about, advancing, in the universe whether we are aware of it or not. The unique aspect of that level of being which is termed human consciousness is its capacity to freely participate in that very process of bringing about being, through proper use of its abilities, or not. (One might note in passing a certain significance to God's answer to Moses' question in the Book of Exodus, essentially "I IS who IS," or the more grammatically palatable, "I AM who AM"!)

Note that once something has come into being it cannot "un-be." One cannot go back in time and have something "not happen." Consonant with the capacity of being, of correctly affirmed knowledge, to be shared, the requirements of actual temporal succession can be taken care of by the use of appropriate language. Thus, for example, the expression of some given identical truth such as, "I am here now," is replaced by, "He was there then."

In considering proportionate being, an important consideration concerns the fact that we cannot think nothing, we have to think something, that which is generally included under the term "being." Being is the most fundamental concept. It embraces the total reality of the entire universe. There are four fundamental aspects to it:

1) Through imagination we can construct *images* of things that don't

actually exist such as dragons or unicorns. This is of high importance in generating insights and can lead to dramatic consequences as instanced, for example, by those that resulted from Einstein's imagining the possible experience of an observer riding a light beam.

- 2) At the level of insight there occur *possibilities* that may be judged to exist, or not to exist other than as mere beings of the mind. Thus, for example, if out walking, an outline in the distance might, or might not, be a tree. On coming closer one may very well be able to affirm that the object is indeed a tree. Or, as another example, the door which is shut could possibly be open.
- 3) A further context arises with regard to the *properties* of things. Thus, the seasonal crops of apples that come and go involve, so to speak, associated changes in the tree without its ceasing to be a tree.
- 4) Finally, there is the tree itself that continues as a distinctly *subsisting* (remaining distinct from its relatedness to what is other than itself) thing throughout its lifetime, whether it gives rise to apples or not.

A particularly important aspect of the "pneumochip's self-assembly" involves the *synthetic power* of the mind. One act of understanding can and does grasp several objects in a single view. Understanding a house is not understanding severally the foundations, the walls, the roof. It is understanding the whole. The synthetic character of understanding is illustrated, not just in the concept of a whole such as a house, but also in the learning of a science (V, p. 52). Note that the mind does not remember. To know the past as past, like knowing the present, is the work of sense (V, p. 40). Insights are not like unrelated atoms, they develop, coalesce, form higher unities (V, p. 40). Thus insight into some aggregate of terms and relations, sufficient for immediate purposes, may be affirmed to yield a concept termed "house."

A practical outline of the knowing "self-assembling pneumochip" might be summarized as follows. A *thing* encountered through the senses, through the three levels of operation, experiencing, understanding, and judging is affirmed

to exist. In response to whatever requirement seems appropriate, again using the operations, *parts* are also affirmed to exist, also the *relations* between the parts, thus determining the *nature* of the thing. The parts, through the operations, may be related to the whole thing thereby determining them as *constituents*. A concluding insight and judgment affirms the *thing* as a concrete, unity, identity, whole.

In general, knowing can occur in two modes, each concerned with its own potential, formal, and actual components. These may be roughly described as follows. In the first mode, there is experienced, or imagined, understood as a unity, a thing which is affirmed to exist, an instance of *central* potency, form and act. Some of its aspects, properties, its relations to other things, may be experienced, or imagined, understood for what they are and affirmed to occur, an instance of *conjugate* potency, form and act. These six elements characterize the being of the thing, that which the operations are assembling, becoming part of oneself, the manner, so to speak, in which one fills in one's "empty form of time." Note that the crucial matter of appropriate empowerment for the process, that is in terms of objects eliciting feelings that enable authentic development, has as yet to be addressed.

The most general term for any expression involving words is *utterance*, whether spoken, written or merely imagined. Such utterances can, of course, be attended to at the level of experiencing, constituting an input to the cognitive process. Thus we have access to that vastly greater world of *meaning* which includes the accumulating product of other human heads. Meaning itself can be true, false, or varyingly probable. However, at its core, there is a progressive accumulation of that which has been publicly verified, attested to, that which is *true* and that which is *real*.

In accordance with the notions summarily outlined above, there is in the world an accumulative and progressive field of meaning, one in which, to a greater or lesser extent, we are all called to play a role. Thus it is that we bring about a unique *being*, a unique *you* or a unique *me*!

The foregoing summary of the fundamental mental activity involves a high level of abstraction that clearly warrants some attempt at an elementary practical example. This involves a variety of difficulties. Firstly, one is dealing with operations so familiar and obvious that it is no easy matter to let go of everything else we know and attend to them. Secondly, words have to be employed to show how words come about. Otherwise one would be reduced to pointing, gestures, pulling faces! Thirdly, there is a flexibility with regard to our mental activity. This introduces a personal element into the manner in which different people reach the same conclusion.

Let us accordingly suppose that, as a small child, one has been brought by one's parents to what is going to be one's new home. It is all very exciting. At the first opportunity, one rushes out into the garden to explore one's new domain. One finds a shed, and in it a heap of parts all painted the same bright colour, a concrete unity, identity, whole, a thing (the heap), completely engrossing one's attention and curiosity (a spontaneous desire to know). What is it?

Imagination goes to work to provide possibilities. One starts to experiment. It would seem that "this" is related to "that" because they fit neatly together and so on. Eventually there are no parts left over and one has a thing that is a concrete, unity, identity, whole. One rushes off to tell one's parents of one's achievement. In response to one's stumbling efforts with an extremely limited vocabulary, the appropriate words are supplied, nuts and bolts, wheel, bearing, handles, box, legs and so on. Finally, there is established the concept signified by the word, or term – wheelbarrow! All the parts have been named and related to one another, and to the whole, to yield the concept wheelbarrow, a subsisting entity in its own right. This is appropriated by the mind as an instance of *central* potency, form and act.

There remains the coating (the bright colour), which shows signs of wear and clearly needs to be replaced from time to time. This is appropriated by the mind as an instance of *conjugate* potency, form and act. (Other instances could include the entire history of the relations between the thing and its surroundings, the rest of the universe, its manufacture and employment, etc.). The six

elements constitute a new level of meaning that one has achieved, one that can be passed on to one's little friends. Eventually, however, one can apply the same basic ideas to one's own mental processes, dramatically realizing the extraordinary nature of that in each of us which we take so much for granted.

This section may be read through and leave one with the impression that one "sort of knows" what it is about. This, however, falls far short of the conviction that comes from inventing one's own examples, of "clothing" the highly abstract concepts in a manner that is appropriate for oneself. In Chapter 7 this process will be applied to the manner in which salient notions in our present knowledge of the universe have come about and to its extraordinarily counterintuitive nature. This leads to an increasing appreciation of our own astonishing role in it as beings that are, not only *intelligent*, but also *intelligible*.

3.5 RELATION – AN ILLUSTRATION

Insight into relation is of such key significance that it warrants some practical elaboration in terms of a personal experience.

As a highly inexperienced night-shift chemist in a factory ship on the Antarctic whaling grounds, the bane of my existence was a part of the processing plant which, if the automatic control unit malfunctioned, would discharge to atmosphere great quantities of high pressure steam with a deafening roar. This was not a good thing since the engineers, in their glittering metallic world far below my feet, had to distill 750 tons of fresh water a day from sea water so that the plant, never mind ourselves, might be spared the legendary fate of the Ancient Mariner. Worse still, the exhaust pipe enjoyed an airy location, not that far removed from the palatial cabin of the chief chemist, high on the forward superstructure. I discovered that by twiddling a screw in the main control unit, I could stop both the deafening roar and the upsetting phone calls from high up on the other end of the ship, not to mention enhance the likelihood of further employment on the next voyage. At that time, I didn't know how that part of the plant worked or how the complicated control unit worked, but I did

know the relation between a slight adjustment of a screw and these preferred outcomes.

It is, of course, highly imprudent to be content with such minimal knowledge: and on returning to the UK I undertook a training course with the manufacturer to obtain the further required relations. The first set of relations consisted in those existing between the relevant terms in the general differential equation of continuous automatic process control, specifically the proportional, integral and derivative terms. Then these terms had to be related to the various units in the actual control system itself and their various adjustments, which could in turn be related to the performance of the flasher unit in the plant itself.

Such a control system involves the fundamental notion of feedback. This presupposes some desired state of a system and modifications in the input to the system such that any departures from that state are eliminated.

In the present case, the aim of this introduction to one's "mental apparatus" is to present the relations between the "units" on board the "human spacecraft" such that one can optimise its state through varying its inputs, attentively, intelligently, reasonably and responsibly. To do so knowingly is to appropriate oneself.

Self-appropriation can only be achieved through attending to instances of one's own experience over a widening group of representative contents.

Possibly the two major instinctive tendencies that have to be overcome stem from childhood convictions that reality is confined to the data of sense, and, further, the tacit assumption that what one does not know does not exist. "The labour of self-appropriation cannot occur at a single leap. Essentially, it is a *development* of the subject and in the subject and, like all development, it can be solid and fruitful only by being painstaking and slow." (INS, p. xxiii)

3.6 FEELINGS

The primary considerations entering into the present context may be summarized as follows:

- Feelings *empower* the conscious living of the subject, the actuation of affective capacities, dispositions, habits, the effective orientation of one's being.
- There has been and remains, a widespread tendency to overlook the spiritual, intentional and meaningful character of feeling responses (von Hildebrand, 1953).
- 3) Feelings are fundamentally *spontaneous*. They do not lie under the command of decision as do the motions of our hands. But once they have arisen, they may be *reinforced* by advertence and approval, or they may be *curtailed* by disapproval and distraction (M, p. 32).
- 4) Feelings may be positive, an assessment that something is good for me, or negative, that something is bad for me.
- 5) A given object can give rise to different feelings in different subjects.
- 6) Feelings may vary in kind, for example with the *disposition of the object*.

| Object | Present or Absent | Absent | Present |
|-------------------|-------------------------|----------|---------|
| FEELING | | | |
| POSITIVE | Love | Desire | Joy |
| (Good, suitable) | Attraction | | Delight |
| NEGATIVE | Hate | Aversion | Sorrow |
| (Bad, unsuitable) | Revulsion | | Sadness |

Table 4 – Variation of Feelings With Disposition of the Object

- 7) Feelings may vary with *changes in the subject*. Judgements with respect to something good as being attainable or unattainable can give rise respectively to feelings of hope or despair. Judgements with respect to something bad as being superable or insuperable can lead respectively to feelings of courage or fear. Confronted by an insuperable evil there may simply be anger for which the only remedy is calming down! (Aquinas, 13th century)
- 8) At any point in life, there is an *habitual* orientation of feelings, attitude, outlook, stance, disposition that is a consequence of past behaviour, past decisions, past actions or failures to act (INS, p. 189). One becomes oneself by one's choices (UB, p. 282).
- 9) As the body requires an appropriate flow of nutrients, so the mind calls for its own flow of psychic representations, an appropriate flow of sensory inputs, of *symbols*, that is of *imagery* that evokes, or is evoked by *feeling*. It is through symbols that heart and mind and body communicate (M, p. 67). The question arises as to how such a genuinely authentic communication can be brought about in the best interests of both one-self and others.

3.7 FEELINGS AND INTENTIONALITY

1) Non-intentional responses include:

States, such as: moods, anxiety, ill-humour, fatigue. (States have causes.)

Trends, such as: hunger, thirst, sexual discomfort. (Trends have goals.)

- 2) Intentional responses include:
 - a) The agreeable/disagreeable, pleasant/unpleasant, these are generally characterized by a desire to have, possess, own, and are apt to lead eventually to boredom and emptiness.

b) The values, truth, beauty, goodness, noble actions which lead us towards self-transcendence, generally characterized by "joy in the presence of," by "self-abandonment." Value is what is intended in questions for deliberation (MIT, p. 34).

Scale of Value

Objects giving rise to value responses give rise to a scale of preference depending on the degree of self-transcendence to which they give rise. Despite the imposing name, transcendence is the elementary matter of raising further questions (INS, p. 635).

The scale of values is the key to the structure of community. The relations between the levels of value correspond to the relations between the levels of consciousness. From below, the more basic levels are required for the emergence of higher levels, but they also set problems that only development at the higher level can solve. From above, development makes possible the fulfilment of needs at lower levels. The relations between the levels of value in a healthy developing community correspond to the relations between the levels of the hierarchy of values in a healthy developing individual consciousness (Doran, 1990).

Thus there exist:

(IN A CONSCIOUSNESS) (IN COMMUNITY)

- (Experiencing) Vital Values: - Health, strength, vigour, preferred to work, effort, privation, in bringing them about in community.
- b) (Understanding) Social Values: - Good of order providing vital values for community more important than vital values of individual members.
- (Judging) Cultural Values: – Are concerned with finding

meaning and value in the living and operating of the community.

d) (Deciding) Personal Values: – role of person in self-transcendence, loving and being loved, originator of value responses in oneself and others in community.

e) (Loving) Religious Values: – "At the summit of this ascent is to be found the deepset joy and solid peace of being in love with God." (M, p. 39)

The same gift can be given to many and the many can recognize in one another a common orientation in their living and feeling. From a common communion with God, there springs a religious community (M, p. 118).

Note in particular the originating role of personal value at the fourth level. All human pursuit of the true and the good is included within, and furthered by, a cosmic context and purpose (M, p. 242).

In a 1973 CBC radio interview, Lonergan referred to the level of love as a fifth level distinct from the fourth (Crowe, 1989).

The fundamental notion underlying the scale of values is that the more we cooperate and share in life's tasks, the more we can find out, know, learn about the meaning of it all; the more we can know, the more we can enrich our own lives, the lives of others, the lives as yet to come. This emphasizes the role of intersubjective community. It underpins civil community which, though it develops imperceptibly, is still a new creation that gives rise to the good of +0 '

order. Intersubjective community survives "most concretely of all in the inner psychology and radiating influence of women." (INS, pp. 212–3)

Judgments of value are simple or comparative. They affirm or deny that something is truly or only apparently good, or they compare instances of the truly good to affirm or deny that one is better or more important or more urgent than the other.

In judgments of value, the three components unite. First, there is knowledge of reality and especially of human reality. Secondly, there are intentional responses to values. Thirdly, there is the thrust towards moral self-transcendence constituted by the value judgment itself (M, p. 39).

By way of illustration of a value judgment from a different traditional background the following example is taken from Joseph Campbell's television series (1988) on the power of myth. A Samurai warrior whose master had been murdered, tracked the assassin and was about to dispatch him when the man spat in his face. The Samurai sheathed his sword and walked away. He could not commit an act of just retribution under the typically subjective response of anger.

Many other examples may readily be adduced. Thus, the young person who undertakes a full employment of their talents in a prolonged course of professional training is clearly acting in accord with vital, social and cultural values. If this were done to further self-transcendence in oneself and others, it would also be in accord with a response to personal value.

In contrast, one could become a drifter in some loose preoccupation with the fads and fantasies of neurotic art, skillfully marketed by the social engineers in a successful eclipse of anything that might involve a critical value response.

3.8 FEELINGS AND INTERSUBJECTIVITY

In terms of intersubjective feelings, the most powerful state is that of being in *love*. In authentic loving at least four simultaneous aspects may be distinguished (1C, p. 23).

- 1) Love is the basic form of appetition (a power of the mind to respond to the truly good).
- 2) The first principle (an originating power) of becoming (coming into being).
- 3) It is a principle of union between subjects in pursuing a common goal or end.
- 4) It is consummation of the end attained, the shared joy of accomplishment, and ultimately the beatific vision.

Note that being in love with God can be as full, as dominant, as overwhelming and as lasting an experience as human loving (2C, p. 250).

In terms of intersubjective communication of feelings, Lonergan follows the analysis of Max Scheler (M, p. 57). Significant ways in which feeling can be communicated include common feeling and fellow feeling, which have an intentional basis, and psychic contagion and emotional identification which have a vital rather than an intentional basis.

Both community of feeling and fellow feeling presuppose apprehension of objects that arouse feeling. In *community of feeling* two or more persons respond in a parallel fashion to the same object. In *fellow-feeling*, a first person responds to an object and a second responds to the manifested feeling in the first. So community of feeling might be manifested by the sorrow felt by parents for the dead child, while fellow-feeling would be felt by a third party moved by their sorrow.

Psychic contagion is a matter of sharing another's emotion without adverting to the object of the emotion. One grins when one enters a room where others are laughing although one does not know what they find funny.

Such contagion seems to be the mechanism of mass-excitement in panics, revolutions, revolts, demonstrations, strikes where in general there is a disappearance of personal responsibility, a domination of drives over thinking, a decrease in intelligence level and a readiness for submission to a leader. Needless to say,

42 ♦ SCIENCE, SELF-KNOWLEDGE & SPIRITUALITY

such contagion can be deliberately provoked, built up, exploited by political activists, by the entertainment industry, by religious leaders and especially by pseudo-religious leaders.

In *emotional identification* either personal differentiation is as yet undeveloped or else there is a retreat from personal differentiation to vital unity. Undeveloped differentiation has its basic illustration in the emotional identification of mother and infant. Retreat from differentiation can be illustrated by hypnosis or sexual intercourse. In the group mind, members identify with a leader, or spectators with a team, into a single stream of instinct and feeling. In the ancient mysteries, the mystics in a state of ecstasy became divine (M, p. 58).

IV. COGNITIVE AND AFFECTIVE DEVELOPMENT

"Development seems to be from an initial state of undifferentiation through a process of differentiation and specialization towards a goal in which the differentiated specialties function as an integrated unity." (M, p. 138)

4.1 COGNITIVE AND AFFECTIVE SYNTHESIS

Table 2 may now be extended to include the role of feelings, in particular those leading to judgements of value response and decisions with respect to courses of action on the fourth level of intentionality. Note that judgment affirms or denies while decision consents or refuses. Judgment is concerned with knowledge of actuality while decision is concerned with conferring actuality on that which otherwise would not exist (INS, p. 613).

The term "will" refers to this capacity to make decisions. "Willingness" is the state in which persuasion is not needed to bring one to a decision. "Willing" is the act of deciding (INS, p. 623).

It is important to note that the elements given in Table 5 should not be thought of as sequentially processing "objects" as they move from one "box" to another like articles in a factory. Each level sublates the previous levels, that is, it "retains but goes beyond," sets up a new principle, type of operation, directs them to a new goal, but so far from dwarfing, preserves them to a fuller fruition (MIT, p. 316). Significant change on any level calls for adjustment on the other levels (MIT, p. 120).

The primary intention of Table 5 is to facilitate a personal awareness of the

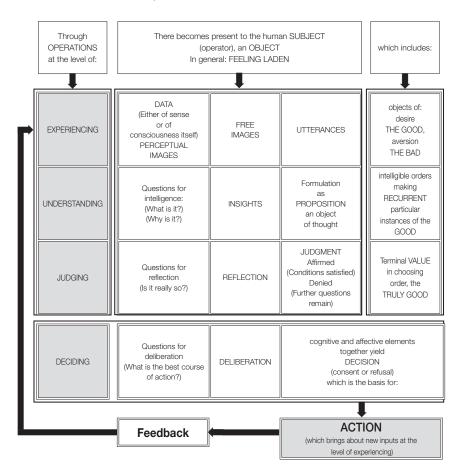


Table 5 - Cognitive-Affective Synthesis

operations, of the objects intended, and of the associated feeling responses, especially those that constitute responses to the truly good, to value, those that empower progress to higher levels of knowing and increasingly positive feeling states. It could thus be regarded as a processing unit of a spiritual nature, a self-assembling "pneumochip" that works on and assimilates the incoming feeling-laden imagery, "feeds on symbols." It is, however, much more powerful than that, for it can grasp the nature of its own procedures and in that

knowledge achieve increasing skill in application, ever more surely affirm its own validity. Four broad contexts of operation may usefully be distinguished.

A first context is concerned with *what has already happened*. It may be trivial, such as identifying the sound coming from the basement as the spin-cycle of the washing machine, or involve some protracted intellectual endeavour of naming, defining and formulating in explaining some complex natural process. It involves response to the fundamental desire to know, to understand correctly. Other feelings stemming from prepossessions or unwarranted convictions are only apt to prejudice the outcome.

A second context retains, but goes beyond, the first in that, in considering what has happened, it also takes cognizance of associated feeling states. Thus one may ask, for example, was a particular feeling non-intentional, simply a state or a trend, or was it intentional in that it was associated with a particular object present in consciousness? If the latter, was it merely a matter of spontaneous desire or aversion, some transitory satisfaction or aggravation, or was it an instance of value response, something consistent with long-term development of both oneself and others, even though effort and perhaps some privation were required? (Note that there is tacitly assumed an essential freedom from limitations in implementing the precepts due to elements in one's own past.)

In a third context, attention is directed, not to what has happened, but to what could happen, possible courses of action and outcomes. In this case, the first two levels of Table 5 are involved in attending to data, insights into possibilities, into schemes making recurrent instances of the good. Account is now being taken of feeling responses with respect to what might happen. Judgement of value occurs at the third level of Table 5. Note, for example, that one can approve of what does not exist (M, p. 37). Is one considering a possible instance of something that is truly good? How does it fit in with the scale of values? Is there a possibility that would be truly better? The terminal values arrived at are objects of possible choice (INS, p. 601), that is, objects to be consented to, or refused, at the fourth level. Further, one can grasp the virtually unconditioned and thereby attain certitude on the possibility of a proposed course of action

(INS, p. 611). It is in the process of judging and evaluating possible plans of action to be executed that there are apt to occur conflicting feelings such as hope and despair, courage and fear. It is here also that some form of prayer can aid in stilling the psychic flow, bring about the patience required for the emergence of insights, feelings, and circumstances that conduce to actions in the genuine interest of oneself and others. "Execution generates *feedback*." (M, p. 366)

A fourth context concerns the application of Table 5 in *a reflective manner* to one's own performance. One can meditate on the conscious flows in the first, second, or third contexts. One can apply contexts one and two to the outcomes of actions based on deliberations undertaken in the third context and its concern with authentic self-transcendence, that which benefits not merely oneself but also others. "The results of such attention to feedback will be that policy making and planning become ongoing processes that are continually revised in the light of their consequences." (M, p. 366) Indicative of that authenticity is the ease and facility with which one can implement the precepts, with a growing realization of the role of spirit in the universe, of the magnificence of its destiny. There is a succession of enlargements of consciousness, a succession of transformations of what consciousness means. "Despite the imposing name, transcendence is the elementary matter of raising further questions." (INS, p. 635) It would seem that the way to authentic cognitive and effective self-development might be depicted in terms of "a hygiene of mental questioning."

An interesting and highly pertinent illustration of the use of Table 5 may be found in listing the salient operations that occur in coming *to believe*. Thus human knowledge is not some individual possession but some common fund from which each may draw by believing and to which each may contribute in the measure that one performs one's cognitional operations properly and reports the results accurately (M, p. 43). Firstly, at the level of experiencing there is encountered some communication. Secondly, having regard to the benefits of participating in "publicly attested to" knowledge there is a general judgement with respect to the value of belief at the third level of Table 5. Thirdly, there is a particular value judgement at that level with respect to the authenticity

of the communication, trustworthiness of sources, technical competence, etc. Fourthly, at the fourth level of Table 5 there is a decision to believe, based on the preceding general and particular judgements of value. Fifthly, there is the act of believing, a judgement at the third level to accept, in my own mind, the truth of the communicated judgement of fact or of value.

4.2 DEVELOPMENT

When a fundamental threshold of neural complexity is crossed, there comes into being an entity which becomes aware of itself through awareness of that which is other than itself; there arises that confrontation between subject and object which has been developed above in terms of the cognitive and affective aspects of intentionality analysis, an inner restlessness that will not be stilled. It is an incitement to grow, to realise one's potential in a specific context of some interval in space-time, particular circumstances, strengths, abilities, talents, weaknesses, shortcomings, handicaps. One has to learn to "fly the human spacecraft."

It might appear that intellectual mastery of the terms and relations in Table 5 will suffice. A life tackled in that manner will result in something of the nature of a psychopath!

What one is seeking is sustained progress in some sort of overall representative feeling state which lies outside one's experience until it has occurred, something in the realm of what the eye has not seen, nor ear heard, nor has it entered into the heart (1 Corinthians 2:9). Guidance is to be found in objects initiating value responses. Thus it is that the contents of our insights, judgements and decisions must be embodied in images, events, situations, relationships, occurrences that flow spontaneously into deeds no less than words.

The pure desire to know sets up exigencies and tendencies that are opposed to me as a concrete functioning unit with desires and fears. If my cognitional process is guided by my desires and fears, the result is not knowing but simply wishful thinking (UB, p. 281).

Imagery that evokes feeling becomes symbol, the "raw material" of the mind which functions, if one might be permitted a minor relapse into chemical engineering jargon, by distilling value responses from subjective crude! It is no trivial task.

The terms and relations of Table 5 provide a practical working model of one's own conscious operations. That it will remain, unless it is verified in the familiar context of one's own experience. The concepts must be "clothed" in some sufficiency of personal affect-laden imagery, retrospective outcomes, good or bad or misguided decisions. One begins to grasp how one's performance could have been vastly improved if one had considered this or taken the time to inquire into that or had had the courage to face up to it. But these are the very insights that will enhance future performance. The "human spacecraft" is not some gnostic flummery of New Age jargon. It's meant to be flown, and flown with all the ability and talent with which one has been endowed, however small or great these happen to be. It takes sustained effort and no one else can do it for you.

The following reflection on a personal experience is offered by way of an illustration. On one of those days in early childhood when total absorption in pretending could open untold kingdoms of the imagination, I decided to be a submarine captain. A suitable vessel could readily be provided by digging a hole at the end of the garden and covering it with an old wooden packing case. My vessel was however, never destined to leave the dock for, in the course of construction I dug up a small heavy iron thing.

Much intrigued, my imagination went to work to try and fit it into some sort of context. Could it be part of something? Perhaps it was an old weight from a cuckoo clock. Perhaps it was some sort of bottle. It had a very small stopper. Let's see if there is something inside. Wandering back to the garage I put it in the vice and started work on the stopper with an old hammer and chisel. My father came in and seemed very put out by my innocent endeavours. In fact, he ran off with my bottle and threw it in the river! Several years later, when our instructor produced a No. 36 Mills hand grenade, the outline was all too

familiar! In fact, a month after the confiscation of my bottle, a short paragraph in the local paper announced that, at low water, a hand grenade had been reported to police and exploded by the military, though I'll warrant not with a hammer and chisel!

It is not difficult to identify the basic conceptual themes. Subject, object, sense data, a thing (concrete, unity identity whole in data), question, free image, no insight, nothing to judge, decision, action (acquire more data). Second subject, perceptual image (and how!), emotional identification, prompt action based on vital value response.

Such exercises may very profitably be extended into the realm of drama and literature, particularly into the great works which can dramatically illustrate the success or failure in life in terms of value response as distinct from the excessive preoccupation with the merely subjectively satisfying, and not only that but, as it were, an "ascent" of the scale of values which finds its proper culmination in a death which is but a preparation for the real performance! Thus for example, Ibsen's play, *A Doll's House*, dramatically illustrates honesty of vision, courage, and authenticity in accord with that which lies on a higher level on the scale of values, in seeking the truth, no matter how unexpected or unwelcome. (The Anthony Hopkins/Claire Bloom film is much to be commended.) At the other extreme, the television exploits of "Mr. Bean" cleverly satirise a life largely motivated by immediate subjective satisfactions.

The crucial point in development is the transformation and transvaluation of the symbols that move us, such that there is a gradual sustained progress in self-transcendence. This should not be taken to imply that the subjectively satisfying be carefully avoided in strict deference to the sombre demands of value response. There is much to commend a good dinner with convivial friends, a decent car, domestic comfort, opportunity to travel. One is subject to physical and psychological limitations and sustained effort requires its complement in terms of relaxation. It is when these things become an end in themselves and start to be employed as compensation for the internal tensions arising from unrealized potential, failure to accord with the scale of values, and distractions

have to be replaced with something bigger and better, that there is initiated a process of decline. The failure in the transformation and transvaluation of symbols points to a block in development. It is one thing for a child, quite another for a man to be afraid of the dark. Adventure stories and magazines of my schoolboy days all now seem rather silly. On the other hand, the *Chronicles of Narnia* of C.S. Lewis retain a charm and fascination mostly because they so eloquently depict the effort and the striving which are intrinsic to that very process of the transformation of symbols itself, the life-long search for the truly good.

So laconic an account of the fundamental dynamism that concretely orders the events of a life time would seem to warrant some attempt at practical amplification in terms of personal experience. My memoir, *Pictures On My Pillow: An Oceanographer's Exploration of the Symbols of Self-Transcendence*, is just such an attempt at practical amplification in autobiographical form. It was published in 2011 by Agio Publishing House.

4.3 VERIFICATION

To what extent is this fundamental cognitional scheme verifiable? That, one must answer for oneself through attending to one's own conscious activity. However, as noted by Lonergan, "unless some of his organs are deficient, who is going to say that never in his life did he have the experience of seeing or of hearing or of touching or of smelling or tasting, of imagining or perceiving or feeling or moving – how rare is the man who will preface his lectures by repeating his conviction that never did he have even a fleeting experience of intellectual curiosity, of inquiry, of striving to understand, of expressing what he has grasped by understanding – rare too is the man that begins his contributions to periodical literature by reminding his potential readers that never in his life did he experience anything that might be called critical reflection, that he never paused about the truth or falsity of any statement ... Few finally are those that place at the beginning of their books the warning that they have no notion of what is meant by responsibility, that never in their lives did they have the

experience of acting responsibly ... In brief, conscious and intentional operations exist and anyone that cares to deny their existence is merely disqualifying himself as a non-responsible, non-reasonable, non-intelligent somnambulist." (MIT, p. 17) In fact, the fundamental structure of terms and relations shown in Table 5 must be employed in any attempt at their own refutation.

The fact that one can't refute them does not mean that one is convinced. As noted above, it is only by applying the model to one's own experience, setting up illustrative thought experiments and stories, but above all in trying to live by it, that real conviction is attained, the real conviction that will be described later in terms of conversion. To be able to do it involves self-appropriation.

First of all, self-appropriation is advertence to oneself as experiencing, understanding and judging. Secondly, it is understanding oneself as experiencing, understanding and judging. Thirdly, it is affirming oneself as experiencing, understanding and judging (UB, p. 37).

"We make ourselves. ... We develop in response to situations, outside influences, but we also develop from within. That development from within is becoming aware, explicitly conscious of what intelligence is; becoming explicitly aware of what judgment is; and seeing the philosophic implications of intelligence and judgment." (UB, p. 120)

Though not specifically referred to as such, a compelling illustration of the potential of self-appropriation under appalling circumstances is to be found in Victor Frankl's book (with a title of particular significance in the present context, *Man's Search for Meaning*, published in 1963). It is an autobiographical account by a Viennese psychiatrist of existence in that abomination of evil, of which no mere animal is capable, a Nazi concentration camp. Frankl writes, "I kept thinking of the endless little problems of daily life ... I became disgusted with the state of affairs which compelled me daily, hourly, to think of such trivial things I forced my thoughts to turn to another subject. Suddenly I saw myself ... giving a lecture on the psychology of the concentration camp. All that oppressed me at that moment became objective, seen and described from

the remote viewpoint of science. I succeeded somehow in rising above the situation, above the sufferings of the moment and I observed them as if they were already of the past. Both I and my troubles became the object of an interesting psychoscientific study undertaken by myself. What does Spinoza say in his ethics? Emotion which is suffering ceases to be suffering as soon as we form a clear and precise picture of it." This is an extraordinary example of the power of meaning in the journey of the human spirit.

"The prisoner who lost faith in the future – his future – was doomed," writes Frankl. "With his loss of belief in the future, he lost his spiritual hold; he let himself decline and became subject to mental and spiritual decay." ... "Our generation is realistic for we have come to know man as he really is. After all, man is the being that invented the gas chambers of Auschwitz; however, he is also the being who has entered those gas chambers upright, with the Lord's Prayer or the Shema Yisrael on his lips."

As witnessed by the indiscriminate mass murder of the terrorist bomber or the evil intent of those who encourage and support them, and the appalling potential of chemical, biological, and nuclear weaponry, there is a growing urgency to work out long term solutions to the world's social problems.

Verification must ultimately be brought about by effort in the life of the individual, and then by the accumulative striving of such individuals in community. At any time in life there exists some unity of the human spirit, a continuity in its operations, a cumulative character in their results (2C, p. 128). In the intellectual context it is "powered" by wonder, the pure desire to know. In the affective context there are feelings of "awe, fascination, the uncanny. There is an openness to the world, to adventure, to greatness, to goodness, to majesty." (TIE, p. 214)

By one's own free choices, one makes oneself. Thus there is an *essential freedom* in which possible courses of action are grasped by practical insight, motivated by reflection and executed by decision. There is also, however, an *effective freedom*, that includes the limitations placed upon that essential freedom. Such

limitations can be external constraints, such as location and time in history, personal circumstances and so forth. Other limitations are of an internal nature, such as one's psychoneural state (that should provide materials for the higher levels of operations). There are the limitations of intellectual development and the struggle through the process of learning.

To grasp the nature of one's conscious operations is to grasp the way in which they are meant to be employed in one's own best interests. Morality is a matter of doing just that. One is invited to become intelligent, reasonable and responsible not only in one's knowing but also in one's living, to guide one's actions, "not as an animal to a habitat, but as an intelligent being to the intelligible context of some universal order that is or is to be." (INS, p. 473) In employing the operations, the basic problem is to discover the events, happenings, circumstances, sources, occasions, relationships, locations, institutions, the feeling-laden images that both correspond to intellectual contents, orientations, determinations, yet also "possess in the sensitive field, the power to issue forth not only into words but also into deeds." (INS, p. 561) "Our sensitive living is a matter of images that release emotions and affects, and result in action." (UB, p. 267) "One's willing is efficacious in one's living insofar as what one wills can be connected with images that are efficacious for oneself." (UB, p. 269) "Choice is a determination in personal development." (UB, p. 282) "Knowledge, of itself, does not settle a course of action. ... knowledge grounds different and even opposed courses of action." (UB, p. 279) It is, however, in one's own best long term interests to develop the habit of deciding on the basis of the truly good, of value, and not only the truly good, but the truly better. As in the case of learning, that does not involve merely spontaneous gratifications, but the effort, the striving, not only for that which is truly right but for that which is truly better.

The affects associated with the different levels can be considered in terms of a tendency towards, a striving, a reaching out, an appetite. Even prior to being attended to at the first level of Table 5, there occurs a "natural appetite which is blind;" at the level of experiencing "there is a sensitive appetite which is

spontaneous;" at the levels of insight and judgment there occurs a "rational appetite that can be moved only by what reason pronounces to be good." (V, p. 201) "Will, then, is intellectual or spiritual appetite. As capacity for sensitive hunger stands to sensible food, so will stands to objects presented by intellect." (INS, p. 598) An habitual willingness to act in accord with the scale of values has to be acquired, our sensitive spontaneities scanned for those which, responsibly acted upon, in the context of one's own personal circumstances, history, strengths, talents, weaknesses, will lead to further steps upward along the long climb of self-transcendence.

It is a decisive step in the process of self-transcendence when we do not merely think of the universe but begin to know what the universe really is (3C, p. 132).

4.4 A METAPHOR APPROXIMATING THE HUMAN JOURNEY

The implications of Table 5 are so profound in terms of the human journey that it may be helpful to develop a metaphor for that journey using the analogy of space flight.

To a first approximation the "self-assembling" spacecraft is the "bearer" or "carrier" of the "operations," the "operator" and the accumulating results of all the operations in terms of meaning and affective state up to any instant during the flight.

The "space" in which the flight occurs is, however, somewhat more subtle. In introducing the notion of Einstein's four-dimensional space to a general audience an approximate device is the notion of "flatlanders" who live in a flat plain rather like a group of intelligent mobile ink blots. Such a group, if told about a third dimension, would find completely unimaginable such things as lamp posts, trees and mountains because such constructions would go completely beyond their available everyday imagery. We are used to three-dimensions and have the requisite imagery but run into the "flatlanders" problem when we try to visualize a four-dimensional object in terms of our everyday three-dimensional imagery. If we realize that the fourth dimension is merely a device for

locating something in time as well as space (three numbers, shall we say, for "along, across, and up" and one for time) the difficulty is resolved.

For our spacecraft, however, we need a "fifth dimension", not just the four-space that contains the totality of events (locations and times) that constitutes the working out of the universe, but the "intelligibility" that *relates* together all those events, the causes, the information that would enable a "super-being" to construct the lot from pure energy, everything that is in one's past, is in one's now, is in one's future, the real world, the world of being. Once one has become part of that totality of events, including one's operational capacity, one cannot un-be, withdraw from the universe of being.

Through verified insights and responsible action we can become a part of that creation, through participation in God's thought in gradually becoming like Him by putting into practice the precepts, be attentive, be intelligent, be reasonable and be responsible.

Thus one can elaborate the notion of an "inner space" of which conventional space-time is but a part. How does one find guidance in an expanding and always uncertain "inner space" of the "human spacecraft" in the course of its temporal journey? Since there appears to be a fundamental intelligent directing principle that both originates and attracts, how might we depict a possible individual relation to it?

Let us suppose that this personal "inner space" is a tiny "elemental volume" in a vast "multi-dimensional radar display" under the scrutiny of the "cosmic traffic controller." Each "elemental volume" is characterized by particular locations, times, circumstances and also abilities, talents, weaknesses. It is required to negotiate the former by using the latter attentively, intelligently, reasonably, and freely. If we choose, the unique "elemental volume" swept out can be guided by insights and value responses that become ever more closely convergent on some optimum track that is truly right for that particular "craft," which ensures breaking free from the enormous "gravitational pull" of the merely subjective responses, of release from self-confinement, and of achieving access to the

56 ♦ SCIENCE, SELF-KNOWLEDGE & SPIRITUALITY

direct and fundamental empowerment towards self-transcendence that is value response. On the other hand, of course, we can rely on our own "on-board" resources until they fizzle out!

It is intriguing to speculate whether such a "hyperspace" and its contents might ever yield observables in any conventional scientific sense. Perhaps controlled hypothermia and its reversal might open up new realms of experience to be negotiated attentively, intelligently, reasonably and responsibly!

V. MEANING AND CONVERSION

"For our pasts have made us whatever we are, and on that capital we have to live or else we must begin afresh."
(MIT, p. 181)

5.1 SUMMARY OF OPERATIONS

Employment of the operations (Column 1) brings about a *synthesis*, both progressive and accumulative, of cognitive and affective elements that manifests itself in higher levels of authentic meaning attained and the opening up of new levels of spontaneity of feeling, the conversions. Thus, over the step-by-step journey of a life, value responses constitute feeling responses that urge courses of action which will bring about situations giving rise to new levels of feeling response which, up to then, have not as yet occurred. These culminate in the excitement and anticipation of falling in love with a mysterious, uncomprehended God and his creation.

Table 6 depicts firstly what becomes present, an object (Columns 2 through 4) to the operator or human subject through putting into practice the operations listed in Column 1. (Downward movement in the diagram is intended to reflect Lonergan's increasing the level of the consciousness through implementing the operations, "the hard-won movement from "darkness" to "light.")

Note that the first three levels of Columns 2 through 4 are directed towards establishing the real, the true, what "really is so." Column 5 takes account of the fact that in the general "feeling-ladenness" of the contents of Columns 2 through 4 (note that indifference is also a possible feeling), there are included possible objects of desire from which we can determine, and make recurrent,

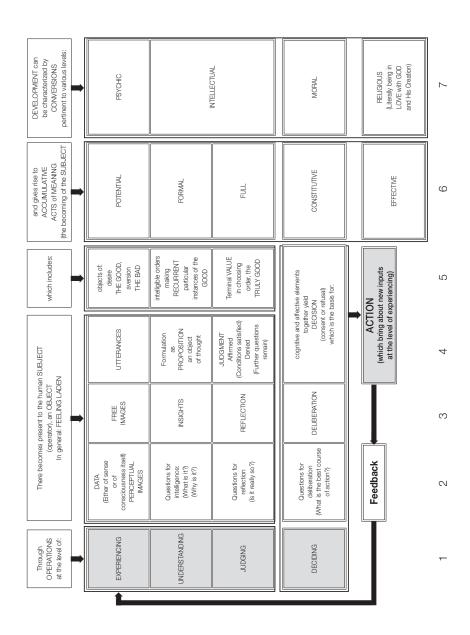


Table 6 - Cognitive-Affective Development

instances of the truly good or value, what could be so, that which leads to genuine development, authentic cognitive and affective self-transcendence. The fourth level of deciding (Column 1) considers possible courses of action for bringing about what is truly good, what is truly of value.

5.2 MEANING

Persistent employment of the operations leads to an "on-board accumulation" of everything that has been thus objectified, an accumulation that includes the contributions from the respective levels as "acts of meaning" (Column 6). These acts come laden with the values deriving from Column 5.

Basic notions with respect to meaning may be summarized as follows:

- Meaning can progress and accumulate over a lifetime while the biological substrate occurs, grows, declines and dies. It is a product of intelligence (CLI, p. 200).
- 2) What is meaning? Meanings are similitudes of things. Meanings may be true or false, but at the core of meaning is being, publicly verified, correctly affirmed knowledge, the object of the pure desire to know. To know what being itself is, one would have to know, to correctly understand, the entire working out of the universe, to be omniscient.
- 3) We can, however, correctly understand parts of the overall picture, the overall plan, through being attentive, intelligent, reasonable and responsible. What intellect knows, it knows by meaning, by asking and by answering questions (1C, p. 244).
- 4) Thus the *sources of meaning* are all conscious acts and all intended contents (1C, p. 73).
- At the level of experiencing there is a *potential act* of meaning (data, perceptual and free images, utterances) which is not yet understood

 there is as yet no distinction between the meaning and what is meant.

- 6) At the level of understanding through insight there is a *formal act* of meaning as there emerges a possible distinction between meaning and the meant. (One is dealing with acts of conceiving, thinking, defining, formulating, supposing, considering.)
- 7) At the level of judging there is a *full act* of meaning. One settles the status of the object of thought. There is attained an increment of truth, reality.
- 8) Such acts of meaning come with judgements of value, affective responses to the truly good become *constitutive acts* of the self-assembling human subject in an ongoing process of development.
- 9) Decision and action are *effective acts* when based on meaning and are crucial to the emergence of the authentic subject finding out that one must decide for oneself what one is to make of oneself.
- 10) Meaning takes us out of the infant's world of immediacy (the world of pleasure and pain, hunger and thirst, food and drink, rage and satisfaction, and sleep) and places us in the adult's world which is a world mediated by meaning. ... "As the command and use of language develop, one's world expands enormously. For words denote not only what is present but also what is absent or past or future, not only what is factual but also the possible, the ideal ... what we can learn from the memories of other men, the common sense of community, pages of literature, labours of scholars, investigations of scientists, experience of saints, the meditations of philosophers and theologians." (MIT, pp. 76–77) ... "what is true is of itself not private but public, not something to be confined to the mind that grasps it, but something independent of that mind, and so, in a sense detachable and communicable." (MIT, pp. 44–45)
- 11) Rational belief plays a crucial role in our encounter with the world mediated by meaning. "Belief is accepting what we are told by others on whom we can reasonably rely." (INS, p. 427)

5.3 CONVERSIONS

There result positive changes in outlook, disposition, stance, *conversions*, changes in attitude or ways of regarding things, to different or more positive attitudes or ways of regarding things (Column 7). Note that these do not necessarily occur in an order corresponding to the levels of consciousness. Thus a religious conversion may provide a powerful motivation to undertake the lifelong tasks of bringing about the other conversions.

(In this present context there is assumed the ideal case of a human subject unimpeded by internal disorders calling for therapeutic intervention. Thus the discussion of psychic conversion is deferred until later.)

A) INTELLECTUAL CONVERSION

Intellectual conversion is the elimination of an exceedingly stubborn and misleading myth concerning reality, objectivity and human knowledge ... that overlooks the distinction between the world of immediacy, say, the world of the infant, and on the other hand the world mediated by meaning (MIT, p. 238).

"To be liberated from that blunder, to discover the self-transcendence proper to the human process of coming to know, is to break often long-ingrained habits of thought and speech. It is to acquire the mastery in one's own house that is to be had only when one knows precisely what one is doing when one is knowing. It is a conversion, a new beginning, a fresh start. It opens the way to ever further clarifications and developments." (MIT, pp. 239–240)

B) MORAL CONVERSION

"Moral conversion changes the criterion of one's decisions and choices from satisfactions to values. ... As our knowledge of human reality increases, as our responses to human values are strengthened and refined, our mentors more and more leave us to ourselves so that our freedom may exercise its ever advancing thrust towards authenticity ... then moral conversion consists in opting for

the truly good, even for value against satisfaction when value and satisfaction conflict." (MIT, p. 240)

C) RELIGIOUS CONVERSION

"Religious conversion is being grasped by ultimate concern. It is other-worldly falling in love ... a dynamic state that is prior to and principle of subsequent acts." (MIT, p. 240) ... "a total being-in-love as the efficacious ground of all self-transcendence, whether in pursuit of truth, or in the realization of human values, or in the orientation man adopts to the universe, its ground, its goal." (MIT, p. 241) ... "Questions for intelligence, for reflection, for deliberation, reveal the eros of the human spirit, its capacity and its desire for self-transcendence." (MIT, p. 242)

"But that capacity meets fulfilment, that desire turns to joy, when religious conversion transforms the existential subject into a subject in love, a subject held, grasped, possessed, owned through a total, and so an other-worldly love." (MIT, p. 242)

There is a "happiness that has a determinate content but no intellectually apprehended object." (PGT, p. 54)

5.4 IDEALIZED ILLUSTRATION

There was developed above a metaphor of the human journey in terms of a "space flight," the possibility of optimally developing an "inner space" under the benevolent scrutiny of the "cosmic traffic controller" through "on board implementation" of the basic norms of its own procedures as summarized in Table 5. Let us now extend the metaphor in terms of the developing "on board four-dimensional accumulation" of contents, once conscious, and the overall feeling state that results.

The discrete entity, the "human spacecraft," the "self-assembling pneumochip," that is uniquely oneself comes into being when the subject/object, or me/not-me, division occurs and finds itself in a world that is persistently changing,

moving to higher levels of complexity and functioning, as it itself is changing, moving to higher levels of complexity and functioning. Subject and object fuse in an ongoing expansion of consciousness, an expansion that can grasp the norms of its own procedures through its incredible capacity to reflect on its own activities, to possess, to appropriate itself.

How does it deal with this overwhelming flux of change? This occurs, initially, through the operations acting on experience of the things that surround it in two manners that can roughly be described as follows. A first manner involves encounter with some thing in which some level of change or development has already occurred, through insight grasping some new level of functioning which is possible, through judgment affirming that this is actually occurring (more formally, knowing in terms of central potency, form and act). Thus there are insights into the relations between the parts of the thing, and the relation of individual parts to the whole.

A second manner involves the notion that the thing itself can have attributes, properties, or intelligible relations to other things. These themselves display some level of development or functioning. Through insight one grasps that some further level of activity is possible, and through judgment, that this is actually happening (more formally, knowing in terms of conjugate potency, form and act). In terms of these six metaphysical elements, presupposed by psychology, and which can be assembled to yield each particular instance of knowing, there is accumulated a single reality, the four-dimensional aggregate of meaning which is the "becoming" of the one and only unique edition of oneself. Insofar as this occurs in accord with the basic norms of one's own operational procedures, in accord with value responses, there is accessible ever-increasing levels of empowerment, variously encountered in terms of the conversions. Thus it is that mind encounters the evolving universe, that which has brought it into being and furnished it with the potential for further development.

A key transformation occurs when it applies its operational abilities to itself, to its own workings upon the incoming data of sense. Its development as a being

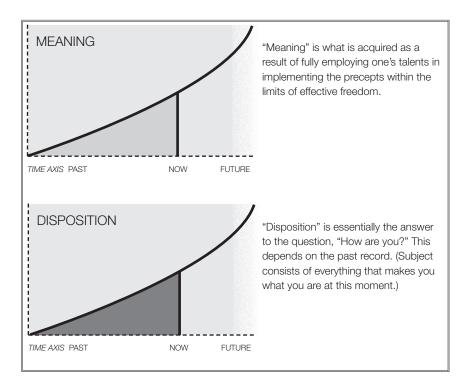


Figure 1 – Growth and Accumulation

can never "un-be," never withdraw from the four-dimensional totality of interrelated events that constitute the working out of the universe.

Suppose that the "human spacecraft" is equipped with two fundamental indicators, respectively of "level of meaning achieved" and of some representative "overall feeling state or disposition attained." Using the output from such indicators it might be helpful to graphically depict a highly idealized "journey through life" using arbitrary, but similar, curves to denote the change in these outputs with time. The shading is intended to denote some integration or summing over time (what one has "become"). Persistent implementation of the precepts, be attentive, be intelligent, be reasonable, be responsible is assumed, also freedom from inordinate affections, attention to value responses, etc. (The

exponential character of these curves imply what would seem to be a plausible assumption, namely, that there is some average rate of growing or developing which is proportional to that which has already occurred.)

The horizontal axis conveys an image of time as a raceway of indivisible instants. The "now" in which the human "subject self-assembles" should not be thought of as one of them. The "now" is a psychological present, a time span. Our experience of time is not a raceway of instants but a "now" leisurely, "now" rapid succession of overlapping time spans. The psychological present reaches into the past by memories and into the future by anticipations. Anticipations are not merely of the prospective objects of our fears and desires, but also the shrewd estimate of the person of experience or the rigorously calculated forecast of applied science (M, p. 177).

In contrast, God (our "cosmic traffic-controller"!) wills the universe and the eternal act is timeless; what is true at one instant is true at every other instant (INS, p. 662).

Have we wandered into the realm of science-fiction and departed from the real world? Well, one's attending, inquiring, judging and deciding are certainly real enough, not to mention the accumulative and progressive "publicly-attested-to" understanding of the universe, with all its attendant hazard, until, perhaps, we properly understand ourselves!

VI. INDIVIDUAL AND COMMUNITY

"Meaning enters into the very fabric of human living but moves from place to place, from one age to another." (M, p. 44)

6.1 ORDER AND COMMUNITY

The emphasis in the "feedback" model described above has been on the individual. In considering the scale of values, there was, however, clearly implied the responsibility of each individual in the ongoing development of community. "Just as in the individual the stream of consciousness normally selects its own course out of the range of neurally determined alternatives, so too in the group. Commonly accessible insights, disseminated by communication and persuasion, modify and adjust mentalities to determine the course of history out of the alternatives offered by emergent probability." (INS, p. 211)

"As the command and use of language develop, one's world expands enormously. For words denote not only what is present but also what is absent or past or future ... what we come to learn from others, from the common sense of the community, from the pages of literature, from the labours of scholars, from the investigation of scientists, from the experience of saints, from the meditations of philosophers and theologians. ... In this larger world we live out our lives. To it we refer when we speak of the real world." (M, pp. 76–77)

"Meaning enters into the very fabric of human living but moves from place to place, from one age to another." (M, p. 81)

"Through communication and belief there are generated common sense, common knowledge, common science, common values, common climate of opinion. ... belief is... possible because what is true is of itself not private but public, not something to be confined to the mind that grasps it, but something independent of that mind and so in a sense detachable and communicable." (M, p. 44)

The human good is at once *individual* and *social* and the way the aspects combine may be summarized as follows.

The human subject, as characterised by the elements in Table 6, is now to be visualized as a member of a group, a shared enterprise which must seek out not just the particular goods required by each member of the group, not just some scheme of recurrence that will ensure regular availability of such goods, but some as it were, overriding true good of order. Such a true good of order will be selected by the group attentively, intelligently, rationally, responsibly, on the basis of a *terminal value* that serves the truly good in itself of all the participants. The manner in which the capacities of individuals may be ordered to achieve such a terminal value is summarized in Table 7 (M, p. 48).

The *ends*, the goals to be achieved, are listed in the right-hand column. These are to be achieved in the context of *liberty* which is at the bottom left-hand corner. "There is such a thing as progress and its principle is liberty." (INS, p. 234)

At the first level the *capacities* of the individual may be actuated in accord with Table 6 to meet the *needs* satisfied by *particular good* though without any particular regard for the overall group interest.

On the other hand, needs could be met much more easily and effectively in a *cooperation*. To bring this about, there is set up an *institution* which, taking into account the *plasticity* and *perfectibility* of individuals to develop *skills*, assume *roles*, can arrange for the orderly fulfilment of the tasks required by the institution. ("An institution is a mechanism set up for making decisions." (TIE, p. 35)) Thus there is set up some possible good of order. Down to this level of the Table we are just as likely to find ourselves with a lazy, sullen, resentful group forced into some sort of collaborating by circumstances, as we are

| INDIV | IDUAL | SOCIAL | ENDS | |
|-------------------------------|----------------------------|----------------------------|--------------------|--|
| POTENTIALITY | ACTU. | ENDS | | |
| Capacity, Need | Operation | Cooperation | Particular good | |
| Plasticity, Perfectibility | Development, Skill | Institution, Role, Task | Good of Order | |
| Liberty | Orientation, Conversion | Personal relations | Terminal value | |

Table 7 - Structure of the Human Good

with a happy, motivated, hard-working, resourceful organization that makes life really worth living, the joyful participation in a truly worthwhile venture. For the latter circumstance to be realized, tasks must be carried out in a context of *personal relations*, characterized by mutual respect, support, sharing of knowledge and skills. This calls for individuals to exercise their *essential liberty*, to attentively, intelligently, reasonably and responsibly become themselves originating sources of value in an orientation which brings about not only the conversions in themselves but conduces to that in others, not only enlarges one's own horizon of consciousness and reduces the limitations imposed by effective freedom, but helps bring that about in others.

6.2 PERSONAL RELATIONS

It is in the highly complex and demanding field of personal relations that we are apt to encounter, not only our greatest challenges, but also our greatest rewards. We must seek out the symbols (people, situations, circumstances) that, over a lifetime, advance the authentic realization of one's potential, whatever

its strengths or limitations. This generally occurs in the context of institutions, whether global, national, economic, professional, educational, ecclesial, family, etc. Such symbols must be transformed in accord with the scale of values, giving rise to higher levels of spontaneity in positive feelings, bringing about an authentic enlargement of consciousness, not only in ourselves, but also in others. It is an exacting task that can extend from the high vulnerability of one's early years to some level of patient wisdom achieved with age.

When considering the role of feelings in intersubjectivity, a distinction was drawn between common feeling and fellow feeling, which have an intentional basis, and psychic contagion and emotional identification, which have a vital basis. It is important to attend to these distinctions, both in ourselves and others, to patiently assemble the data for one's authentic living, no matter how exasperating that may be. There can occur characteristic groupings of feelings; love, gentleness, tenderness, intimacy, union go together; similarly hatred, alienation, harshness, violence, cruelty form a group. Of particularly high practical significance in achieving the good of order in a community are the temporal sequences of feelings associated with challenge to an individual or group engaged in activities destructive to its common good of order. There are such sequences as offence, repentance, apology, forgiveness of offence, contumacy, judgement, punishment (M, pp. 64–65). Punishment involves some appropriate deprivation of the good of order if only to protect the legitimate interest of the group. Of particularly lethal significance is that pride which seeks acquisition and exercise of power over others for one's own selfish purposes and also the resentment of some value attribute in another that brings about a belittling of the value in question for oneself. Thus it is that we are confronted with the necessity of judging, not only our own actions in accordance with the precepts implicit in Table 5, but also those of others. In making such moral judgements it is advisable not to ask such people what they think about morality but to watch what they do (TIE, p. 98).

As noted above, this presentation is intended to provide a group of concepts, which when practically illustrated in one's own experiences, ground relations between elements in one's own conscious operations and functioning which

have profound consequences, that become ever more dramatically apparent in the later stages of one's life, and will do so ever more effectively in planet Earth's future crew when it learns to conform to the inbuilt laws of the human spirit!

One of the biggest single positive influences in any institution is a leader who is an originating source of value. An example, which immediately comes most pleasantly to mind, is the lady who ran a Scout Troop in a village near to where I had been evacuated during the war. The old manor house in which she lived had stood for some five centuries, sheltered within a fold of the Wiltshire downs. It became home for a group of evacuees from the tough east end dock area of London. She took no nonsense from them and they worshipped her. The worst of them, though she was warned by his London teacher that he should never be allowed into the Scout Troop, ("Of course he can if he wants to!" was the reply) subsequently became a Chief Detective Inspector in Scotland Yard!

Another instance involved the company chairman who, in the canteen of our London office in Grosvenor Square, seemed just as much at home with and interested in the commissionaires or secretaries, the accountants or technical staff. Whenever there were personal problems or difficulties there was a gruff understanding and a helping hand. No one would dream of taking any liberties, but he commanded a loyalty and affection which are deserved and accorded to, by few.

At the heart of such leadership is a genuine concern for personal value in others. It was the theme of General Eisenhower's address to the last graduating class of young officers from the Royal Military College at Sandhurst before the D-Day landings.

One can also think of many individuals in less exalted roles who, in accord with the same principle of true value contribute immensely to the work of organizations to the fullest of their abilities, which in the long run, is all that is asked of us. One, who started loading sacks of sugar on the docks at age 12, barely literate, and who had become a winchman on a factory ship, put every penny to ensuring

72 ♦ SCIENCE, SELF-KNOWLEDGE & SPIRITUALITY

for a large family of brothers and sisters the chance of an education that he had to forego himself.

It is of such persons that Hilaire Belloc (1906) wrote, "It is not true that influence of this sort decays or passes into vaguer and vaguer depths of memory. It does not dissipate. It is not dissolved. It does not only spread and broaden; it also increases with the passage of time."

VII. OUR WORLD?

"One might say that it has taken modern science four centuries to make the discovery that the objects of its enquiry need not be imaginable entities moving through imaginable processes in an imaginable space-time." (INS, p. xx)

7.1 THE EMERGENT

If consideration thus far has been concentrated on developing the fundamental functioning of the human spirit, the "self-assembling pneumochip," it would now appear appropriate to locate its role in the context of the evolving universe. This is attempted in the following brief outline.

At its highest known level of complexity, the evolutionary process of the universe has given rise to human consciousness, with its extraordinary capacity to grasp the nature of its surroundings, reflect upon itself and its operations when doing that, think about its own thinking, feel about its own feelings, affirm its own existence. It would seem that this achievement is subject to an extremely sensitive dependence on the known laws of physics and numerical values of associated fundamental constants. This gives rise to the notion that the intelligible laws of nature have been ordered to bring about such a self-consciousness, the so-called anthropic principle. Since the laws of physics thus far established seem to hold throughout the observable universe, there is no reason to suppose that planet Earth is unique in this context. In fact, there is growing evidence for the existence of other planetary systems. One might reasonably suppose that the universe has something of the nature of a broadly-based intelligent ground.

As noted earlier, mind carries no data on its own neural embodiment, admits of no simple reduction to matter (whatever that is!). It can, however, reflect upon its own activity. In Chapter 3 there were outlined the basic operations by which, individually and collectively, consciousness grows to yield higher and higher levels of *meaning*, the product of mind. Meaning itself can be true or false, but at its core is *being*, publicly verified, correctly affirmed knowledge with respect to the present level of development of the universe. (Note that the emphasis here is on a practical skeleton outline of the pneumochip's manner of self-assembly which is prior to immense developments in linguistics, logic, mathematics, psychology, and so on.)

The manner in which this comes about has been described in terms of the mind's encounter with things presented in sense data, the distinguishing of parts and of the relations between the parts to yield the nature of a thing, distinguishing the relations between the parts and the whole to yield the constitution of the thing. Each step involves the extraction and affirmation of *concepts* from the data, and then a movement through expression of individual concepts, immediately experienced, to definitions, in which simple concepts, linked together by the word "is," form more complex concepts that demonstrate the *synthetic* power of mind.

There was emphasized the need for expression so that the mind could render present earlier concepts, transmit them to other minds. Such expression may employ words derived from some set of agreed-upon signs. In its simplest form, this could be binary code, with its two symbols, "0" or "1," the bit, or the presence or absence of a pulse, as used in computer operations. Thus a particular sequence of bits could render present to one's own mind, or to another mind, the meaning of the concept, what had given rise to it in the first place. The sequence could be displayed visually or through some agreed-upon attached sound. The ability to represent concepts, the distinctions and relations employed in determining the nature and constitution of things, increases exponentially with the number of bits in the string employed. (It is of interest to note in this connection that the brain, with its extraordinary capacity to

present or to "re-present" sensory data, and to interface with mind, contains some hundred billion neurons, each with many interconnections. There are also indications that thinking can expedite further thinking, bring about further levels of interconnection.) How has our knowledge of our surroundings and of ourselves come about?

There is an accumulative and progressive synthesis of concepts ranging from those deriving from immediate experience to the explanatory concepts demanded by the increasingly complex nature of, and necessity to relate to, our surroundings. The word "explanation" carries with it the implication of "making plain" or "traceable back to its origins." If one were asked by some questioner, "What is a jetliner?" one could start down a pyramid of concepts "cemented" together by the word "is." The question is directed towards what Aristotle termed its *formal* cause, that which makes it what it is. (The primary concern of science is with such formal causes.) One might be interrupted by a further question, "But, what is it for, what is its purpose?" One might then start on another "pyramid" of concepts heading towards the economics of transportation, some *final* cause. The chances are that there would soon be an interjection of something like, "Now I understand – someone told me I should go by jetliner!" The questioner had arrived at a "virtually unconditioned," a meaning that could be readily affirmed and prove perfectly adequate for practical concerns at hand. (Other questions might have concerned a *material* cause and led in the direction of metallurgy and mining. There might also have been a question as to the *efficient* cause, leading to considerations of the work force, or an instrumental cause, directing attention to tools, assembly and machine shops, or its *exemplary* cause in the mind of its designer.).

At some time, however, there comes up for most of us the question, "What am I?" It seems that any attempt at an answer would convey something of the incredible magnificence of that to which mind has access through application of its own operational norms, that for which the data of sense is but a beginning, that which can soar limitlessly beyond those beginnings to the extraordinarily counter-intuitive nature of our origins. This would appear to warrant some

brief outline of the salient concepts, fundamental links in the chain of formal causes, deriving from the physical sciences, which, in dramatically illustrating our cosmic origin, hold high promise of an even more remarkable destiny. The object is to relate such basic concepts as energy, matter, information, order, probability, intelligence, and being.

CLASSICAL MECHANICS:

For practical convenience, there are affirmed experiential concepts such as here, there, near, far, along, across, up, now, past, future, heavy, light. However, these would give rise to questions requiring further explanation such as "How far?" or "Where?" or "When?" or "How heavy?" Thus, there would be a need to set up standards for comparison, units of length, time, and mass. From such standard scales could be derived further useful concepts such as direction (requiring some three ordered lengths on some agreed reference frame), speed (involving change in a length over a given interval of time), acceleration (change in speed over a given change in time), force (that required to give some specified mass a given acceleration). Force may be merely static, as, for example, in a supporting pillar, or move its point of application over some length, thus bringing about some physical change. This gives rise to the particularly significant concept of work, the product of force by length. (Note that the change may be constructive, that is, in the direction of increasing order, or destructive, that is in the direction of decreasing order). The appropriate units for these more complex concepts derive from the fundamental units, selected by common consent, for length, time and mass (say, for example, the metre, the second, and kilogram, in common scientific usage). Thus, there arose classical mechanics, a study of the interactions between matter and the forces acting on it.

GRAVITATION:

Experience of things falling would give rise to the notion of an attraction between things, the concept of *gravitation*, a word deriving from the Latin word

for heavy. This is clearly associated with the word *force* above and gives rise to the concept *weight*.

PROBABILITY:

From experience of degrees of anticipation, or of expectation, came questions that could be answered by counting how often a particular outcome would arise in the course of some sequence of events. This leads to the concept of probability with a scale of values which would range from zero, that is, of complete impossibility, up to one, implying absolute certainty, and with a range of fractional values in between. Such a probability is always relative to something else, whether what is already known or to other instances in some class of events. Probability usually comes into play where there are a large number of influences at work.

ORDER:

A particularly significant experiential concept is that of *order*. The world is encountered in terms of higher and higher levels or order. It was the Greek word for order that gave rise to the term cosmos. Order comes about when a multiplicity of elements, members, parts, comes under some unifying principle, some law. The structure and order of the parts gives rise to the concept of organization.

COMPLEXITY:

This implies a more highly organized multiplicity. Thus an atom is more highly organized than an electron, a molecule than an atom, a cell than a molecule, and so on.

HEAT:

Other experiential concepts such as hot, cold, melting, boiling, would call for other scales of measure, those of heat and temperature. Heat consists primarily of the motions of the molecules constituting a thing. Temperature is an

overall measure of such agitation in the thing. If placed contiguous to another thing where the motions are less, that is, at a lower temperature, there is a spontaneous transfer of heat to the latter. There could then be defined a further concept, entropy, the ratio of the heat added to a substance to the temperature at which it was added. Done in successive tiny increments, these could be summed to give some net increase in entropy. Note that in each little transfer the same amount of heat, which was at a higher temperature, is now essentially at the lower temperature of the cooler thing and thus involves a spontaneous and inevitable increase in entropy. This is one of the most fundamental laws of the universe (the Second Law of Thermodynamics). Of particular interest, however, is the very large increase in entropy associated with a change in a substance from a solid state to a liquid state, or a liquid state to a gaseous state when, in the course of this, there is no concomitant change in temperature. It would thus seem that entropy change is closely related to the way in which a substance is "held together," subjected to some ordering principle. In general, for any closed system containing parts at different temperatures, the entropy of that system will always increase to some maximum. When that is reached, no further change can occur. If the universe is considered a closed system, it will inevitably become subject to its own heat death in the remote future, a speculation which has carried distressing philosophic implications for many.

The spontaneous growth of entropy in the universe can be quantitatively linked to a similar spontaneous movement towards much more probable states of greater disorder, simply because there are vastly more of them. Such a probability has been termed thermodynamic, from the Greek words denoting heat and force. Consider, for example, the vast variety of ways (swapping the position of one book with that of another would constitute another way!) in which the scattering of books in an untended library could be realized, in contrast to the limited number of ways that might result from some appropriate ordering by a librarian. (Fortunately for us, it would seem that the universe is overseen by something of the nature of an exceedingly knowledgeable and industrious librarian!)

MAGNETISM:

Experience of stones (from Magnesia in Asia Minor) with remarkable powers of repulsion or attraction, depending on relative orientation, even at a distance, gave rise to the concept of *magnetism* with a scale of measurement based on the concept of force referred to above. There also arose the concept of *field*, the region of space in which one thing comes under the influence of another.

ELECTRICITY:

Immediate experience of sparks (preferably from rubbing amber with a cloth rather than in the form of lightning!) gave rise to the concept electricity, based on the Greek word for amber. It was found that it, also, could bring about mysterious forces of attraction or repulsion. In particular, when caused to flow in some suitable substance, a conductor, it was found to produce a field identical with that of a magnet. Further, if a conductor was moved through a magnetic field, there would appear within it a flow of electricity. If the flow of electricity in the conductor was made to oscillate back and forth with a particular frequency, that is a particular number of oscillations in a given time, there occurred the spreading out of a disturbance of both an electric and a magnetic character, involving the complex concept of an electromagnetic wave. This wave propagated outward with an essentially constant speed (of close to 300,000 kilometres per second) and had the same frequency as was present in the conductor. This would be of immense significance in our understanding of the universe with its own myriad sources of such waves. No upper or lower limit can be set to the possible frequencies of such disturbances which, in our present experience, range from gamma rays, X-rays, to the ultra-violet, visible light, infra-red, microwave, and so on to the broadcast waves of television and radio.

RELATIVISTIC MECHANICS:

It appeared that the universe must be permeated by some "invisible fluid," the *ether*, which would act as a carrier for such waves, something after the manner

in which water can act as a carrier for its surface waves. Since the speed of propagation of electromagnetic waves is known from observation, it now appeared possible to determine the speed of the Earth relative to the ether. This could include the speed of the laboratory due to the Earth's rotation, the speed of the Earth's revolution around the Sun, the speed of the solar system's revolution about the centre of our galaxy, the speed of the galaxy itself. Some of these speeds are known from observation and, through appropriate measurements of the speed of light in selected directions, should have given readily determinable variations. The fact that no such variation was observed led to the notion that, for an observer travelling at a significant proportion of the speed of light, the standard measures of length and time would undergo a significant distortion such that the speed (a ratio of length to time) of the laboratory could never exceed the speed of light. There was no way of determining its absolute speed. The universe became four-dimensional in the sense that, to distinguish one event from another, would require four measure-numbers, three of space and one of time. It was further found that mass underwent a similar distortion with speed, and even that gravitational attraction could be accounted for in terms of the distortions of space and time in the presence of matter. Classical mechanics, though perfectly adequate for terrestrial or local planetary travel, was now replaced by a relativistic mechanics, of which the former would remain a special case.

QUANTUM MECHANICS:

With the invention of high performance vacuum pumps, it became possible to make observations on that which passed between electrodes sealed into an evacuated glass vessel, the electrons. It was also found that naturally occurring substances would spontaneously emit other types of particle and radiation which could also be examined. If relativistic mechanics was brought about by considerations of the extremely large, there would now come about another level of mechanics brought about by the extremely small, *quantum mechanics*. Its primary concern is the interaction between radiation and matter. Observation now required complex apparatus and such a disturbance of the

observed system that there was imposed a stringent limitation on what could be known about it. Any complete description such as was possible in the case of classical mechanics became impossible. Gone were the comfortably observable objects of its inquiry, vehicles, planets, projectiles, and so on. In their place were tiny completely unimaginable entities which appeared sometimes as some minute increment of mass, and sometimes as a wave of probability, of likelihood as to their whereabouts. Thus, its predictions are statistical in character, a matter of probabilities. There may be postulated an essentially unobservable a priori probability distribution, the framework into which observational knowledge may be incorporated. Such a probability distribution may be regarded in the same way as other unobservables such as the frame for space and time in relativity theory (Eddington, 1959). It would seem that the universe presents itself to us as a blank form, of space, time, and probability which is required to be filled in!

MATHEMATICAL PHYSICS:

It may be intuitively grasped that some object on the table will not move unless it is pushed, subjected to some force. Furthermore, the more vigorous the push, the more rapid will be the movement that results. How may such notions be translated into a powerful means of predicting the motion of objects, from billiard balls to spacecraft? These may be formulated in terms of one of the greatest achievements of human thought, Newton's Second Law of Motion. It may be expressed symbolically as:

$$F = m \times a$$

where "F" is a "placeholder" for a number specifying force, "m" and "a" similarly denote mass and acceleration (or rate of change of velocity), "x" denotes multiplication of the two. Given any two of these quantities, we may readily calculate the third.

Reference has been made above to the abstraction of concepts from sensed

imagery, objects presented in consciousness that can be attended to and questioned. Mathematical abstraction involves the process of considering certain features of objects while discounting other features. Such concepts can be expressed as symbols (for example, letters, as above) which can be combined to yield more complex expressions. The mathematician David Hilbert has described mathematics as being rather like a game played in accord with certain rules that allow the construction of sequences of symbols from other sequences of symbols. Thus the operations of elementary arithmetic such as addition, subtraction, multiplication and division, can be expressed algebraically using signs for operations on letters denoting variables, or "placeholders" for numbers. Higher levels of abstraction result when letters are employed to denote particular arrangements of numbers, such as vector or tensor algebras. Starting from certain postulated axioms, propositions held to be self-evidently true, elaborate theorems may be deduced.

Many different relationships between such variables constitute functional relations that are expressed as equations, expressions of the equivalence of certain expressions to other expressions.

Of particular significance is the calculus, both differential and integral. Differential calculus is essentially concerned with finding the ratio of tiny corresponding bits of two related variables as the bits become indefinitely small, for example velocity or acceleration, as referred to earlier. Integral calculus, on the other hand, is concerned with the sum obtained by multiplying the value of one of two related variables by each of an indefinitely large number of indefinitely small corresponding bits of the other, yielding such quantities as areas, volumes or lengths of a curve.

When such variables, and their equations, can be associated with physically measurable quantities, enormous advantages accrue in terms of the communal human quest for knowledge. In fact, the Greek root of the word mathematics means learning. Quantities emerging in the physical theories that can be thus expressed, though not measurable in themselves, can be determined through other quantities that can be so determined. Enormous masses of observed

data can be conceptually condensed into a few simple equations. Hitherto unsuspected relations between physical quantities may be brought out and experimentally verified. One of the most dramatic examples of this mathematical approach is provided by Einstein's Theory of Relativity. This states that whatever the environment of a human observer, wherever or whenever in the universe, the same fundamental equations will suffice to describe one's observations. There is suggested a profound significance to the role of the human spirit in our evolving universe.

ENERGY:

There now arises the question as to whether there exists some concept of such extreme generality that it could, as it were, provide a basis for unifying the immense variety of concepts deriving from the wide diversity of experiential phenomena briefly outlined above. Such a concept is energy, defined as the capacity to perform work, to bring about quantitative change, whether constructive, tending to increase order, or destructive, tending to decrease order, in the universe. It may take the form of kinetic energy, which is associated with motion, or the form potential energy, associated with position, state or shape. (This latter includes gravitational, electrical, nuclear, and chemical energy.) This concept is applicable on the scales of relativistic mechanics on the one hand, where mass turns out to be a measure of energy, and on the other hand, of quantum mechanics, where the frequency of radiation also turns out to be a measure of energy.

By analogy, Freud and Jung use the term energy in the context of excitation of psychic forces.

INFORMATION:

If energy is defined as the capacity to do work, bring about change, information could be defined as the capacity to introduce order into a system and maintain it in an ordered state (Stonier, 1990). This requires work and the information content of a system can thus be related to the amount of work required to

create it. There may be distinguished "useful" work which brings about order in a system, decreases its entropy, and work which merely involves increased disorder and entropy.

The entropy change associated with some given physical change in a system is a quantity that can be measured. It can be shown that there exists a precise quantitative relation between thermodynamic probability and order. In a celebrated little book, What is Life? (1944), Erwin Schrodinger suggested that if thermodynamic probability is a measure of disorder, then its reciprocal could furnish a measure of order. This is equivalent to negative entropy. There results the possibility that measurements of negative entropy changes in a wide variety of physical, chemical, and biological developments in the universe could provide quantitative measurements of the increases in order that result. If it is assumed that information, the capacity to produce order, bears a simple linear relation to that change in order, it becomes possible to express that information change quantitatively in binary units. There arises the possibility of a new field of physics addressing the quantitative role of information in the structure of the universe. A consequence of this would be the equivalence of energy, not only to mass, but also to information, the three fundamental concepts that would ground our understanding of the universe (Stonier, 1990). According to a wide-ranging and perceptive analysis by Loewenstein (1999) "information flow, not energy per se, is the prime mover of life." Of particular interest in the present context is his suggestion that, since all the available evidence indicates that biological process is controlled by intricate multi-level feedbacks, the strongest impact of this aspect of information theory will come in the understanding of such controls within ourselves.

It would seem that energy might be regarded as the "raw material" of the universe which is in-formed and actuated to yield higher and more complex levels of being, of system, of functioning, of operating. The higher the level the greater the degree of freedom, the range of possibilities to which it becomes open, the greater its independence of lower levels without, however, violating their own appropriate norms of behaviour, rules of functioning.

85

GRAND UNIFIED THEORY:

There does not as yet exist however any coherent conceptual unification of the fundamental forces of nature, the strong nuclear force, the unified electromagnetic and weak nuclear force, and the gravitational force, the so-called *grand unified theory*. Present indications suggest that the postulation of further dimensions, in addition to the four referred to above, will be required (Greene, 2000).

7.2 EMERGENT PROBABILITY

There is growing interest today in the question of why simple entities should unite to form higher and higher levels of complexity and function. There appear to be three fundamental approaches.

A first of these considers physical and living systems that expend energy to bring about such higher levels of complexity and self organization. Important concepts involve feed-back, the ability of a system to modify itself using part of its own output, and resonance, the ability of an oscillating system (the frequency of the oscillations being determined by its existing structure) to readily accept further energy input if delivered at its own natural frequency. The increase in energy that results can cause the system to exceed some of its own "bonds" and have its variously developed parts "flip" over into some new configuration with its own rules of functioning. A second approach uses the enormous power of contemporary computers to repeatedly apply deceptively simple mathematical expressions to the result obtained from a preceding application. There result highly graphic patterns that resemble those encountered in such diverse phenomena as traffic flow, heart attacks, or the intricate outlines of a leaf or a snowflake. The third approach involves the search for the principle, the originating power that, given a system with some achieved level of complexity and activity, suddenly and unpredictably displays a whole new level of functioning with its own laws, correlation and capacity for self organization. I suspect that the notion referred to earlier as the anthropic principle will be of particular

significance in that regard. This brings us to the *transcendental method*, the application of the procedures of the human mind to itself.

Reference was made in section 3.4 to the potential, formal and actual components that enter into each single instance of human knowing. It seems possible, as it were, to observe the complexification process from within, from the viewpoint of that which underlies it. The formal component in human knowing is associated with the ability to distinguish and relate with what becomes possible in terms of novel ways of functioning, acting, being. This would seem to have a particular relevance in regard to these present considerations. Thus, for example, a *potential* component in our knowing could be a highly complex grouping of cells. This grouping could have the capacity for sight, the formal component in our knowing. It could give rise to instances of seeing, the actual component in our knowing, the whole being affirmed and the resulting concept being termed "eye." We also are a part of the universe and our actions, our observations, are also dissipative in the sense of requiring expenditure of energy, of increasing entropy, of its becoming unavailable to perform further work. We also are principles of change, whether towards greater order, or greater disorder, of the whole.

It would appear that there exist in the universe two vast opposed, yet linked, principles of change, one spontaneity directed towards increasing disorder, increasing entropy, another spontaneity towards increasing order, decreasing entropy. It is in the course of the former, in processes that dissipate energy, that the latter occur, often in a totally unpredictable manner as, for example, in an instance of so-called chaotic behaviour.

For example, a profusion of sub-atomic entities is systematized in terms of the elements of the periodic table, itself systematized in terms of ordered atomic numbers and atomic weights. An immense new *degree of freedom* would thus come about in terms of the vast variety of chemical reactions rendered possible, from the inorganic to the organic. Such reactions enable a further immense new degree of freedom in terms of self-replicating systems, of cytological processes, a vast diversity of plant and animal life. In this latter context there would

♦ 87

appear yet another greater degree of freedom in terms of consciousness, the capacity to systematize fulfilment of the neurally determined needs of biological concern. Thus the stage was set for the appearance of human consciousness, with its incredible further degree of freedom, not merely to systematize the concerns of sensitive living, not only of becoming the particular animal that I am, but to systematize the whole universe of being and, most significantly, of appropriating oneself as a part of it.

This introduces further considerations of method in human knowing, patterns of recurrent and related operations that yield cumulative and progressive results. In the case of the sciences, there is a *classical method* that results in formulating some ideal, some law, on which vast masses of data converge, laws that can account for much that is systematic in the known universe. Such laws usually contain provisos such as "provided this or that does not happen" or "while ignoring minor secondary effects." The universe is not limited to laws with predictable outcomes which are certain, though some may display a remarkable capacity for reliable prediction such as, for example, those determining planetary motions. There is also *statistical method*. This usually involves counting things or events, determining frequencies, answering the question, "How often?" The outcome is some ideal, some law specifying an ideal set of frequencies from which the data does not systematically diverge. Pertinent to the movement from lower to higher levels of complexity, functioning, there is also genetic method which is concerned with the concept that can draw together, unify, a large range of data, an integrator, but which can also act as the concept, operator, enabling a whole new level of functioning. Finally, there is dialectic method which is concerned with failure to bring together different groups of insights under a single insight. Our immediate concern here, consonant with restricting attention to our fundamental conceptual scientific roots, is with classical and statistical methods.

"Classical laws and statistical laws can coalesce into a single unified intelligibility commensurate with the universe of our experience. The clue is to be found in the *scheme of recurrence*. On the one hand, the world of our experience is

full of continuities, oscillations, rhythms, routines, alternations, circulations, regularities. On the other hand, the scheme of recurrence not only squares with this broad fact but also is related intimately both to classical and statistical laws. Abstractly, the scheme itself is a combination of classical laws. Concretely, schemes begin, continue, and cease to function in accord with statistical probabilities." (INS, p. 117) "In illustration of such schemes one may think of the planetary system, water circulation on the Earth's surface, the nitrogen cycle, routines of animal life, the repetitive economic rhythms of production and exchange. There can be schemes which include defensive aspects, such as for example, the health of an animal. There can be a conditioned series of schemes such that, for example, carnivores live off herbivores, herbivores live off plants, plants require chemical processes that in turn require physical processes. At each stage of world process there is a profusion of schemes in process which make possible the appearance of higher schemes." (INS, p. 118) In short, the immanent order or design in world process seems to be that of emergent probability. There does not seem to be any universal scheme that controls the emergence and survival of the schemes that we know (INS, p. 171).

"The theory of emergent probability exhibits generically the intelligibility immanent in world process. Emergent probability is the successive realization of the possibilities of concrete situations in accord with their probabilities. The concrete intelligibility of space and time is that it grounds the possibility of simultaneous multiplicities, named situations. The concrete intelligibility of time is that it grounds the successive realizations in accord with probabilities." (INS, p. 462)

In an overall perspective, one might include the role of consciousness in the universe as follows.

Firstly, there is objective process that *informs* and actuates its fundamental "raw material" energy, through successive levels of organization to yield higher levels of order, system, functioning (INS, p. 444). It is emergent probability that provides the compound conditioned series of things and of schemes of recurrence such that the developing organism or psyche or intelligence will have

an environment in which it can function successfully (INS, p. 462). Secondly, human cognitional activity is but an instance in which this striving towards being has become conscious, intelligent, reasonable, capable of appropriating itself. Thirdly, its operations head through experiencing to insights and judgements. Fourthly, its corresponding contents involve not three knowings, but single knowings, each with three components, potential, formal and actual. As present knowing is not just present knowing but a moment in the process towards fuller knowing, so present reality is not just present reality but a moment in the process towards full reality (INS, p. 445). Fifthly, there results, both individually and collectively, an accumulation of contents that mounts to successively higher viewpoints with respect to the nature of the universe, its purpose and destiny (INS, p. 520).

The question arises as to whether it is reasonable to suppose that each "pneumochip" survives the dissolution of its biological underpinning to play a role in some reality as yet to come, a universe of information, of limitless possibility?

7.3 THE SUPREME ADVENTURE

"The cosmos is not an aggregate of isolated objects hierarchically arranged on isolated levels but a dynamic whole ... in which one level of being or activity subserves another." The modern scientist sees "sub-atoms uniting into atoms, atoms into compounds, compounds into organisms, finds the pattern of genes in reproductive cells shifting to give organic evolution within limited ranges, who attributes the rise of cultures and civilizations to the interplay of human plurality." (1C, p. 21) "Thus a concrete plurality of lower entities may be the material cause from which a higher form is educed, brought out or developed from latent or potential existence or into which a subsistent form is infused." (1C, p. 20)

At the highest known level of evolutionary process in the universe is that which can reflect upon itself. It is characteristic of a world order dominated by emergent probability that the unordered manifold is prior to the formal good of 90 ♦

higher unities and higher orders; the undeveloped is prior to the developed; there are false starts, breakdowns, failures; advance is at the price of risk; security is mated with sterility. The "pneumochip" has to develop a willingness to respond to the truly good in itself, has to make choices, abide with the consequences or start again. There has to be acquired the ability to transcend all the physical evils that are the shortcomings of a world order that consists, insofar as we can understand it, in emergent probability. Where successful functioning occurs, higher levels of functioning are able to occur.

As noted above, the higher schemes that impose order, law, correlation, on lower schemes achieve an increased degree of independence of the exact quantities that it systematizes in the lower scheme, for example, as one mounts from organism to psyche to intelligence (INS, 463). If intelligence constitutes the higher system that imposes order on one's sensitive living, the question arises as to whether the breakdown of one's organic and sensitive existence is necessarily the end of one's identical existence.

"Human intellectual activity provides the higher system for sensitive living both unconsciously and consciously. It does so unconsciously insofar as it grounds the pattern in which sensitive experience occurs, and in this respect, it is a higher system to sensitive living, as sensitive system is a higher system to organic living. But there is also conscious intellectual control of one's sensitive living, and this differs enormously from the former. For conscious intelligence is engaged primarily in grasping the intelligent systems relative, not just to one's sensitive living, but to the contents of one's sensitive experience. By this shift from subjective acts to objective contents, it is headed towards the systematization, not just of the particular animal that I am, but towards the systematization of the whole universe of being. And it is within its knowledge of the universe that knowledge of itself is attained, knowledge of its function in the universe is acquired and grounds for willing that function provided." (INS, p. 515) This willing is precisely the value response to the truly good in itself, that which leads to transcendence of self.

It is worth recalling that mind is not reducible to its physical ground. Its

extraordinary capacity to be fully present at events in its own past, while being fully present to itself and its surroundings at some other time, was illustrated earlier by certain results obtained by Wilder Penfield (1975).

"Spiritual intelligibility is intelligent while material intelligibility is not; and man's central form (that ordering principle which perdures above, as it were, the persistently changing, energy dissipating, ground of its biological substrate) seems to be the point of transition from the material to the spiritual. As the centre of sensitive experience, it is material; as the centre of the transformation of the sensitive experience by the imposition of intellectual pattern, and as the origin and ground of inquiry and insight, reflection and grasp of the unconditioned, it emerges as spirit." (INS, p. 519)

Material reality cannot perform the role or function of spiritual reality but spirituality can perform the role and function of material reality. What can embrace the whole universe through knowledge can provide the centre and ground of unity in the organic substrate of a single man. It is in virtue of that reach that the universe can bring forth its own unity in the concentrated form of a single intelligent view (INS, p. 520). This would seem to accord well with a concluding statement made by Paul Davies in his book, *God and the New Physics* (1983), "The existence of mind ... as an abstract holistic organizational pattern, capable even of disembodiment, refutes the reductionist philosophy that we are nothing but moving mounds of atoms."

In the words of Sir Oliver Lodge (1929), "The scientifically apprehended universe is a gorgeous palace; but it already shows signs of dissolving into an insubstantial – an immaterial – pageant, and through the wrack, the turrets of the City of God are beginning to appear."

The following personal experience might serve as an illustration of the ability to become present to one's own past. (Note that many factors may interfere, as discussed further in connection with Freud's censor.)

When I was employed at an experimental fish processing plant on the Canadian east coast, a matter arose requiring discussions at the Food Technology

Department of the Massachusetts Institute of Technology. At some point, a pleasant fellow put his head round the door, announced that it was time for the weekly seminar, but that the plane of the anticipated speaker had been delayed. "Could I say a few words – just a small group – very informal?" Finding it difficult to say no, I offered to say some few such words, to such a small informal group, about whale processing! I was promptly led up onto the rostrum of a large neighbouring lecture theatre, a microphone swiftly being tied about my neck while, no notes, no slides, I gazed in horror at a sea of expectant faces, row upon row behind the front row where there was seated the department head, reputedly one-time Quartermaster-General of the U.S. Army, flanked on either side by his professorial staff! I fumbled about for a beginning and then, as it were, I found myself back in what had been my daily work surroundings of some three years. Suddenly it was an hour later and I was being lauded for an excellent presentation! I have no recollection of what happened during that hour but when I turned round, the blackboards behind me were covered from end to end with a complete layout of all the processing operations on the factory ship, product analyses, and so forth. It was a re-creation by mind of that part of my own life. I suspect there is a "me" within each of us that, at the close of one's Earthly existence, takes possession of itself in a similar way, all synthesized into a single concept of a "you" or a "me," that which does indeed survive the dissolution of its biological substrate!

VIII. BREAKDOWN

"Mythic consciousness ... operates without the benefit of distinctions that are generated only by the critical reflective process that is aware of myth and goes beyond it." (INS, p. 530)

8.1 THE PROBLEM

Reference was made above to the role of control in biological processes by intricate multi-level feedbacks and also, that the most dramatic impact of this aspect of information theory will come with an understanding of such controls within ourselves.

The approximate metaphor, drawn from science, which is being developed in the course of this introductory presentation on the thought of Bernard Lonergan involves a "feedback model" of one's mental apparatus as a self-assembling "pneumochip". The notion of positive "feedback" in the present context involves the positive feelings, averaged over some appropriate time scale, which result from inputs that favour an accumulative and progressive ordering of affairs leading towards some agreeable outcome over a lifetime. The notion of negative feedback involves inputs that give rise to disagreeable feelings, averaged over some appropriate time scale, that result from failure, in greater or lesser measure, to implement the transcendental precepts.

The distinction thus devolves on the use or misuse of the "pneumochip's" operations: Be attentive – Be intelligent – Be reasonable – Be responsible. However, all too often preferred outcomes require the tackling of disagreeable tasks while seeking the truly good for ourselves and others. The first three precepts must prepare the way for responsible action based on the scale of values

rather than on excessive preoccupation with attaining the agreeable and avoiding the disagreeable. It is no easy matter. The failure to do so may, or may not, involve circumstances for which we are responsible, for which, in the grand overall evolutionary scheme of the universe, we will somehow be accountable. In short, there can be progress towards some increasing measure of fulfilment or a decline that ultimately leads to breakdown.

The development so far has moved from that tension between subject and object, that characterises the first moment of consciousness, through the notion of intentionality in its cognitive and affective aspects to that which is developed in terms of meaning and the fundamental change in affective spontaneities named conversions. The next step was to locate that process in the context of community and that again in a universe which is fundamentally intelligible in terms of emergent probability and not in any smooth and undemanding process of the determinate and predictable. If the physical evils that result constitute a massive incentive to describe, explain, and control the physical, chemical, biological and psychological substrate of intelligence, the latter enjoys no intrinsic liberation from the stringent demands of its being for cognitive and affective self-transcendence. As noted above, disordered manifolds are prior to their ordering.

As in the animal, there are biological impulses for survival, of hunger for eating, of sex for mating. The pattern of experience has to meet these exigencies by granting them psychic representation and conscious integration. But in the human context experience can be transformed beyond the confines of serious biological purpose into a spontaneous self-satisfying joy in accord with the scale of values.

However, deep within us all, when the noise of other appetites is stilled, there is a drive to know, to understand, to see, to discover the reason, to find the cause, to explain (INS, p. 4). This cannot be achieved by sheer effort to achieve some ideal disposition. There will result a nervous breakdown of sorts. The contents of insights, direction of judgements, the dynamism of decisions (that is the general directedness to fuller intelligibility and systematisation, responses to

value) must be embodied in imagery that releases feelings and emotions that flow spontaneously into deeds no less than words. This will be efficacious in one's living insofar as the imagery is efficacious for oneself. The rule is for a continuous ever more exacting application of the transcendental precepts; Be attentive, Be intelligent, Be reasonable, Be responsible.

All too readily can elementary passion dramatically bias understanding in practical and personal matters. Too readily can one's concern contract to the biological level of experience where vital process and conscious striving pursue the same end (INS, p. 190). There results a flight from understanding. Just as wanting an insight penetrates below the surface to bring forth schematic images suggestive of the insight, so not wanting an insight has the opposite effect of repressing from consciousness a scheme that would suggest the insight. There are apt to be admitted into consciousness some other arrangement or perspective. It is difficult for purely cognitive activity to be dominated by the detached and disinterested desire to know. Fundamentally such an aberration of understanding is an unconscious process (INS, p. 191).

The most common escape is to avoid self consciousness, avoid "knowing thyself." The second most common escape is rationalization, to revise one's "knowing" to accord with one's doing (INS, p. 599). To exclude an insight is to exclude further questions that would arise from it and the complementary insights that would carry it towards a balanced viewpoint. There is generated misunderstanding in ourselves and others, withdrawal into self-justifying fantasy, incomprehension, isolation from any meaningful relation with others, except perhaps to use them.

8.2 PSYCHIC OPERATION

How does Table 5 fail to operate successfully? The following summary also includes material taken from the development of the implication of the transcendental precepts in psychological terms by R.M. Doran (1990).