THE PHILOSOPHY OF SCIENCE

A Study in Thought

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by

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The Philosophy of Science

Chapter 1

Content

The more we know and can do, the less our influence upon the world seems to be. The vastness of "the world" reflects the complexity of our own sensory and interpretive capabilities. We make awarenesses possible with our senses and cerebral functions. We are the central spectator, giver of life, and creator of the quality of existence to the world of our awarenesses. The influence of a chronic "bias" on our interpretations. The peculiarities and potentials of the emotionally neutral zone. The function of "curiosity". Conditions that give rise to exploratory activities. The three existential poles of our personality. The reproductive requirements of the behaviourally flexible species'. The helpless infant. The behaviour of parental care and concern is an out-growth of reproductive requirements for behaviourally flexible species'. Viability may be found in the ability to adapt to rapidly fluctuating circumstances. Classification mechanisms work best, if they are not coloured by strong emotions. Being poorly in tune with the prevailing circumstances. Why instinctive behaviour is often
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Exploring, tentatively and cautiously, the periphery of the known environment.

1 The world in which we live, seems to exist as an enormously vast complex of phenomena and events upon which we have virtually no influence; at least, our ability to influence the world seems miniscule, in particular, if we look a little further than our immediate environment. Yet, we have seen, that the human species is the epitomy of the evolutionary development of behavioural flexibility, together with the ability to manipulate the environment.

2 We have also seen, in the previous essay, how the faculty of conscious awareness, or, rather, conceptual awareness developed, and, how this ability to form concepts contributed to the change from a passive "following" of fluctuating environmental circumstances by the species, to bringing-about an active, deliberate and consciously willed change in these circumstances. We have also discussed, in general terms, the reasons for the development of sensory or perceptual capabilities, and, we know, now, how they became a corner-stone for the ability to interpret the surrounding realities, and to design a complex mode of precisely adapted behavioural responses and manipulative actions.

3 This means, however, that the vastness of the world of our environment is a reflection of the complexity of our own sensory and interpretive capabilities, and, our apparent helplessness as an individual in this vast world of awarenesses, is not as real as it may appear. I am not suggesting, that we have greater manipulative capabilities than we think, but, it means, that our existence is more central and has a greater fundamental importance than it appears to us in a superficial examination. Indeed, we are central to this world in which we exist, because we are, literally, the center of the Universe of our awarenesses, perceptions and thoughts, hopes and fears. The reason for this statement is the simple fact, that all our awarenesses, including the awareness of the world in which we live, are a function of our own existence and reflect the capabilities of an intact human organism.
Not only, do we make these awarenesses possible with our senses and our cerebral functions, but, all our thoughts about the worlds of past existence, or those that may happen to come-about in the future, are mental images, which, we, at the moment of our present existence, construct with the help of our knowledge, past experiences and expectations. For this reason, we have stated, again and again, that, we, as the center of our individual sphere of awarenesses, create, not only, the perception or the interpretation of the world in which we live, (as well as all awareness of the past and the imagination of all possible future worlds), but, we are the essential "giver of life". We are the creator of the quality of existence, including the awareness of ourselves as an entity of conscious existence.

Without our existence, our particular world would not exist, and, the reason, why we find it intuitively preposterous to accept the idea that the world, "as we know it", ceases to exist, when we happen to die, is related to the fact, that the faculties of human awareness persist in those, who are still alive after our demise.

In the previous essay, we have concentrated upon the emergence and evolution of the faculties of symbolic representation and language communication, and, we have seen, how man's conscious, verifiable awarenesses and behaviour-patterns are strongly influenced by emotions and motivations. Our behaviour is coloured by a chronic bias or mood, which may be towards the scale of anxiety and defensiveness, or, it may tilt towards a mood of euphoria and hopeful expectations. As we have seen, this mood of hopeful expectations is prone to occur in situations of chronic stress.

We have touched briefly upon the peculiar possibilities that arise from a prolonged period of emotional near-neutrality, where an organism can remain more or less untouched by existential concerns and emotional behaviour-patterns for a period of time. We have also seen, that such a situation is not likely to persist for any length of time, because, quickly, our existential needs will come to the fore again, and, our behaviour will again become coloured by the need to satisfy these existential requirements.

Here, in this last essay, we like to concentrate upon the peculiarities, as well as the potentials, that are given by this all-important "emotionally neutral zone", and, we have to ask ourselves, first of all, what we exactly mean by the neutral zone of our behaviour. Secondly, we have to answer the question, why, in the species of mankind, the existence of emotional neutrality, well-being and a relative absence of stress, may give rise to this peculiar activity of "curiosity", while in most other animals, but, also, in man, emotional neutrality, or well-being, gives rise to a content and relaxed sleep. Is there an essential difference, here, or,
do we see, only, a difference in emphasis, where the human species uses a larger
portion of its stress-free periods for activities of exploration, while most of the
other animals are less prone to the promptings of a drive to explore and will fall asleep, whenever the stress of existence eases-off?

9 Let us first define, once more, the concept of an emotionally more or less neutral zone, and, we will then try to answer the question, when, emotional neutrality gives rise to sleep, and, when it may give rise to "exploratory activities". The concept of emotional neutrality is linked to the idea, that the behaviour of an organism is centered around the three major poles of existential concern. There is the pole of aggression, or the movement towards a positive or promising situation, such as the presence of food, or a prey. There is also the opposite pole of defense, where an organism, either, flees from a dangerous situation, or, if this is impossible, puts-up maximum resistance to the adversary force. Finally, there is the pole of sexual behaviour, which is the primary occupation of a state of "well-being".

10 If we look at the primitive, uni-cellular organisms that multiply by mitotic division, we see, that a period of "well-being", or abundant food-supply, leads, invariably, to cellular growth, and, then, to reproduction. Even in the more complex, multi-cellular organisms, we see, that the initial phase of existence is taken-up by a phase of growth, where the organism grows and matures into an adult and reproducing organism. During adult life, most of the activities can be grouped around the three existential poles of existential concerns, as we have outlined.

11 In the behaviourally flexible animals, the period of growth and development into an adult member of the species becomes longer, and, it requires a more elaborate form of parental guidance and protection. The reproductive requirements of the flexible species' involve, not only, an appropriate "mating behaviour", but, also, an increasingly sophisticated and prolonged period of "parental care". This takes the form of nest-building and food-supply in the birds, where the period of parental care is extended, until the youngsters can fly and fend for themselves, but, in the mammals, and, in particular, in the anthropoid species', the newborn infant is even more helpless. It can not stand or walk, and, in the case of the human baby, it can not even cling to the fur of its mother. This requires a prolonged period of meticulous care for the infant, not only, by the mother, but, by the father as well. It may require an attitude of care by the entire adult population of a small socially organised group of anthropoids, in order to provide food and adequate shelter for the vulnerable unit of mother and child.
12 If we look at primate or anthropoid behaviour this way, we see, that we can still classify its varied and complex behaviour-patterns according to the three poles we have identified. The sexual pole becomes enormously enlarged; at least, if we can agree amongst ourselves, that the behaviour of parental care is an outgrowth of the reproductive requirements of the peculiarly vulnerable human infant and child.

13 However, the behaviourally flexible animals, and, in particular, the human species, is also heir to a development, where viability is sought, and found, in sophisticated adaptations to transient and rapidly fluctuating circumstances, and, we have seen, that these behavioural adaptations are not based on an instinctive behavioural pole, which has been precisely encoded genetically, but, behavioural adaptation, or "fine-tuning", depends on the ability of a complex sensory analysis of the prevailing circumstances, together with the development of sophisticated cerebral classification mechanisms. These afford the animal an opportunity to classify the incoming stream of sensory impressions into a range of essentially familiar categories or awarenesses.

14 These classification mechanisms work best, if they are not too strongly coloured by a particular emotive state. We have seen, that, an animal existing in a strongly instinctive mode, will behave rather stereo-typically. This means, that it reacts in a pre-programmed manner, and, therefore, it does not take into account the many subtle conditions that are present. We see, therefore, in particular, in human behaviour, that strongly emotive or instinctive behaviour, is poorly tuned to the prevailing circumstances, and, such strongly instinctive behaviour is, therefore, rarely appropriate or rewarded.

15 We see a tendency develop to control instinctive patterns of behaviour, and, we rarely see, that human beings behave in a completely instinctive mode. For example; an uninhibited aggressive mode would be represented by the "rage"; the primitive fury of a massacre or revenge, but only rarely does this happen, even, in protracted and highly emotional conflict-situations, and, if it does happen, we all are shocked, disbelieving that human beings can behave that savagely.

16 Similarly, a strongly instinctive, negative or defensive reaction would be manifested as a "panic", and, while a panic is much more common, and more acceptable, than an all-out rage-reaction, we all know, that a panic is counter-productive, and, that it causes more problems than it solves. The same arguments apply to unbridled sexual behaviour, which is rarely acceptable, often, somewhat embarrassing and laughable, and, almost all societies place stringent guidelines upon the behaviour-patterns of the sexual pole, as well as on other forms of instinctive behaviour.
For a long time, man has acknowledged, at least, in a pragmatic sense, that he can formulate his behavioural responses much better, if he allows a moderating influence from his experiences upon the behavioural impulses of the moment. Only, if man can elaborate upon the basic behaviour-patterns that have been aroused by an emotional mechanism, can he find, or formulate, an appropriate response. This does not necessarily mean that man has always tried, or should try, to exclude all sorts of emotions and feelings from his behaviour. Often, there was no need to do so, and, man seemed to perform best, if he controlled his emotions, but, nevertheless, relied upon an intuitive and partially emotional guidance for his behavioural decisions.

However, when man became highly sensitive to the fact, that he could be precisely aware of a sensory perception or a thought, and, that he could analyse his behaviour, consciously, before carrying it out, sensitive and reflective individuals appreciated the fact, that the clearest observations and forms of thought, together with the most logical explanations, were only possible, if one remained highly alert, and yet, "emotionally neutral". We mean by this, that the sense impressions were not interpreted in the usual positive or negative classification, but, the sense-impressions were evaluated and recorded with clarity and precision "for their own sake", so to speak, and, many, so-called "familiar" objects, sensations or events would acquire a novel or previously unnoticed feature, or a feature to which no attention had been paid before.

You may ask, why such a state of alert curiosity would occur, and, why an organism would not fall contently asleep, if its stream of sensory impressions would fail to arouse an existential pole or concern. This brings us to the concept of the "elan-vital", or the growth pressure. On previous occasions, we have seen, how we can define a living organism as a channel for the dissipation of an energy-gradient of biological energy. Part of this energy is used to fulfil the many existential requirements, but, if there is a "surplus" of energy, we see, that the organism uses this surplus to grow and reproduce. In most species', including the adults of flexible species', we see, that most of the day is taken-up with one sort of care or another.

Taking care of the youngsters is an all-consuming task, and, the remainder of the day is filled with other necessary chores. Logically, adult members with many responsibilities are completely occupied with activities that have an existential significance, even, if their behaviour is far from primitive. On the contrary, it is finely tuned and behaviourally flexible, but, it is nevertheless, existentially coloured, and such adult members will, indeed, fall contently asleep, if there is a chance to do so.
However, youngsters, as well as those lucky adolescents who have careful and intelligent parents watching over them, will have a great deal of surplus elan-vital. Certainly, their surplus energy will largely be absorbed in growth and play, but, occasionally, a reflective youngster may become sensitive to the myriad of sense impressions around him. Parental guidance will undoubtedly prohibit the youngster from straying too far into the surrounding bush or forest, as dangers are present everywhere, yet, there must be a powerful stimulus, based upon this energetically flowing vital energy of a young and growing organism, to explore, tentatively and cautiously, the surroundings of his known world.

Chapter 2

Content

Is the drive of curiosity emotionally neutral?
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An abundance of vital energies has to be channeled.
When governments waste the vitality of their young people.
When boredom and frustration become a spur in the search for excitement and anticipation.
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Some like to look at the wide variety of phenomena occurring around them.
Questioning existing explanations is a difficult road for innovation and change.
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Rejuvenation and innovation may be found through contacts with the "outside world".

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Mechanisms of cultural cross-fertilisation.
Broadening horizons by exploring surrounding territories.
Dispelling the fear for an imagined or exaggerated danger.
Exploring and describing the unknown.
The art of "telling a story" was paralleled by the art of "asking questions".
The quest for precision and honesty.
The art of manipulating an audience, and the need for an objective and critical evaluation.
The logic and coherence of a story; the "proofs" provided by corroborating evidence, and the distinction between personal experience and hearsay.
Developing the techniques for a judicial inquiry and the judicial imposition of a settlement in disputes.
The problem of "judgement" was sometimes "left to the gods".
A "judgement by ordeal".

1 You may object to the remarks made at the end of the previous chapter, and, you may want to point-out, that the drive of curiosity is far from emotionally neutral. As a matter of fact, you will say, curiosity is very much stimulated by a feeling of excitement; by the titillating anticipation of some sort of an adventure or an exciting experience. "Why do you insist upon including curiosity in the zone of emotional neutrality?", you may ask.

2 Indeed, this is legitimate question. Curiosity seems to be a drive like the others, and, it is often associated with a strong feeling of excitement and anticipation, but, I still think, that it is, in essence, due to an abundance of elan-vital, rather than a specific, genetically encoded drive. This abundance can, indeed, be channeled into a more emotional mood by the deliberate search for excitement and adventure, or, even sensual pleasures, and, it does not have to be an emotionally neutral observation or exploration of the surrounding realities, or the realities of one's own existence.

3 The abundance of vital energies in healthy and strong adolescents has to be channeled into meaningful activities, otherwise, boredom and confusion lead to vandalism and other anti-social forms of behaviour. In particular, in modern, affluent and somewhat chaotic societies, the adolescent youth is often a victim of unemployment, especially, those, who drop-out of school and do not have sufficient wisdom or guidance to see the need to acquire a trade.
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4 The road towards self-respect, and the freedom that comes with having an income, is frustrated. The elan-vital is abundant, and has to seek some sort of an outlet. It is indeed a mark of gross ignorance about the basic facts of individual and collective human needs, to see governments of affluent societies waste the vitality of their young people, when they fail to guide them towards meaningful employment. As a result, there are gigantic problems of crime, drug-addiction and alcoholism; of depressing and counter-productive activities, which stunt the growth of the personality and prevent the emergence of a well-adjusted and contributing member.

5 However, let us not slide into criticisms about a lack of understanding by our leaders, or, their neglect of society and its members. In the smaller social grouping, the individual finds much easier, and earlier, a useful role or a position of responsibility, because every healthy adolescent will be required to contribute to the rigors of the hunt or the defense. If an adolescent youngster in an affluent, contemporary society can not find an outlet for his or her vital energies, there will be a strong feeling of frustration, which leads, eventually, to a sense of chronic failure. I believe, that it is the relief of a sense of boredom and frustration, which translates into a feeling of excitement and anticipation, whenever a channel for the dissipation of vital energies is opened-up by an exploratory activity.

6 The point we would like to stress, here, is the fact, that the feelings of excitement and anticipation, which are released when an eager youngster sees a chance to channel his energies into some sort of an exploratory activity, are the result of a release of the tensions of frustration and boredom, and not the result of the fulfilment of some sort of an "existential need". Some students of human behaviour have felt, that the drive of human curiosity and exploratory behaviour is so strong that we should classify this drive as a basic instinct. However, I feel, that it makes more sense to see the strong drive of curiosity and exploratory behaviour as the result of a successful shelter of parental care, or, guidance and protection from the social environment, where many young people experience a relatively easy way of life. This shelter leaves them plenty of spare time and surplus energies. Then, we are back to the idea, that the surplus of vital energies is the main underlying cause for exploratory behaviour.

7 Compared to most animal species', modern man lives, indeed, in a social environment that leaves him plenty of time and energy, after the basic social and existential requirements have been taken care of. If the society is somewhat lax, and, if it does not demand from its youngsters and adolescents, that the surplus elan vital is used to learn something useful, or, to engage in activities that are beneficial for society, then, we see, invariably, the perplexing problems of frustration, depression, vandalism and drug-abuse. These have a pernicious and
far-reaching effect upon the society as a whole, rotting, eventually, this society to the core as the decay spreads and the social structure begins to crumble.

8 A wise and healthy society will always make good use of the surplus energies of its young people. Most of this surplus energy will be translated into activities that are "socially desirable", and, the youngsters are then able to step into the established cultural pathways of their social environment. However, a strong and vigorous society has also intelligent and reflective youngsters, who are less inclined to become totally absorbed by the established channels of behaviour and belief. They may prefer to ponder and to contemplate; to ask questions, and to think; to play a musical instrument, or to examine the world of nature. They like to look at the wide variety of phenomena that are occurring around them, and, they like to question the validity of the existing explanations. The point we want to make, here, is the fact, that, every intelligent and observant individual will, eventually, be able to point to discrepancies or to poorly explained observations, which have escaped attention or have been considered unimportant.

9 However, questioning established opinions is a difficult road for innovation and change, because, any attempt to alter a reality perception or an established way of doing things, creates stiff resistance in the more established members of society. The reasons are clear; it is often difficult to take a suggestion seriously from someone, who is in a lower hierarchical position, and, especially, questions that seem to shake well-established truths, are certainly going to be interpreted as evidence for an appalling "ignorance", requiring a vigorous program of re-education and "correction".

10 Certainly, from time to time, it becomes overwhelmingly evident that there is a better way of doing something, or, a better way of interpreting a phenomenon, and then, the leadership, as well as the entire community, adopts such a change. Then, we see the slow processes of communal adaptation at work, which are such an essential feature of a healthy, flexible and intelligent social grouping.

11 For a long time, adaptation remained a process of rejuvenation and innovation, which was fueled by contacts with the "outside world". In particular, when the population density increased dramatically and most groupings started to live "side by side", we see, that the process of inter-communal contacts became very important. Imagine a successful inter-communal avenue of contact. Let us assume, that, somehow, a verbal or conceptual contact became possible, and, that the primary instincts of suspicion and hostility could be suppressed long enough to see, how another social grouping lived and worked. In essence, there will be an instantaneous availability of alternative modes of existence, or, alternative techniques and methods to cope with the same problems. These contacts between
groupings who lived, worked and thought somewhat differently, because they had evolved along somewhat different lines, were an enormously rich source of innovations and comparisons.

Certainly, a visitor would see or hear, not only, things that were better, but, he would also see practices or ways of doing things, or come across social conditions and religious rituals, which were not appealing, but, then, a re-kindled awareness and appreciation for the way things were done "back home", was a strongly positive experience in itself.

Initially, horizons were broadened by the exploration of the surrounding territories. This led, not only, to a greater familiarity with the surrounding terrain, but, it enhanced the knowledge of what was available, and, what dangers did exist, or did not exist. Often, if was just as important to dispel the fear for an imagined or exaggerated danger, as it was to gauge, accurately, a particular threat. Unwarranted fear for the unknown, or a danger that had become much larger than reality in the vivid imagination of the members of a small community, was a vital obstacle to the formulation of an appropriate behavioural response, as well as a real danger. A courageous act of exploration may well have been rewarded with an enhanced viability through the discovery of an additional source of food, water or shelter.

In short; we see, that the activities of exploring the unknown and communicating the findings with other members of the group, was, probably, the most spectacular way a group adapted to the problems of survival and population growth. The art of describing what one had seen or experienced, and, the art of conveying a more or less accurate description to those who had not experienced the same sense-impressions, lay at the foundation of the evolution of language. However, in spite of the long history of language evolution, together with the gradual increase in conceptual mastery, we still do not see a widespread awareness of the fact, that all our experiences and accounts of what happened, are influenced by the way we have inter-acted with the sphere of our reality experiences.

As a first step in the refinement of the perception of reality, we see, that the art of "telling a story" was paralleled by the art of "asking questions". As the technique of verbal communications became more precise, it also became apparent, that a story could raise as many questions as it answered. As the listener tried to picture, accurately, what he was being told, the need arose to know, exactly, where and when it happened; who was involved; who did what, and to whom; what others said and did, etc.
16 With the communication of a series of events came also the need to understand, why these events took place as they did. The description of things, objects, buildings, or tools and weapons, which the "author" or story-teller had seen, had to become more precise, because it would be of vital importance to know, exactly, how other societies lived, worked and fought, in order to modernise their own equipment and weaponry. This was obviously an essential method of adaptation and evolution, if they wanted to survive.

17 It must also have become clear to an audience, that an "author" may not be revealing the entire truth, or, that he or she may be deliberately or subconsciously distorting the story or the information. This may be the result of an embarrassment for mistakes in which the author was involved, or for which he was responsible, at least, to some extent, or, the author may have been bribed to convey a deceptive message; or the communicator may mislead an audience for his own particular reasons.

18 Therefore, it became necessary to develop some criteria in order to judge the validity of a story. A variety of techniques arose to interrogate an author. Of course, initially, any suspicion that he may be lying, must have caused a reaction of anger, and resulted, quickly, in a variety of threats in order to "force the truth", but, later, a more subtle system developed, whereby an audience could gauge the accuracy of a particular account by the detailed and consistent features of a description; by a clear distinction between what the author saw and heard himself, and, what he heard others say; by providing or asking for "proofs", or corroborating evidence; by the story of another witness, and, eventually, it became possible to judge the quality of a particular communication by the degree of "fit", or coherence, with other facts that were known to the audience.

19 These techniques became especially important, when professional institutions started to deal with the difficult problem of settling a dispute between the members of the larger societies. As we have discussed before, the larger society would not have evolved into a somewhat viable entity without the development of judicial techniques, but a judicial settlement required a set of intelligent behavioural guidelines that could be used to judge the behaviour of a member of the social environment, and, it required an intelligent technique to evaluate, as precisely as possible, whether or not the truth was being spoken during a judicial inquiry.

20 In primitive forms of a judicial settlement, we see, that this problem of judgement was often so perplexing, that it was "left up to the gods" to decide the questions of guilt and innocence. This provided the background of the practice of "judgement by ordeal", where it was assumed, for reasons that are certainly not
fully logical from a scientific point of view, that the individual who escaped death, was innocent.

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Chapter 3

Content

The limited results of scientific observations made with the "naked senses".
The discovery of a much larger and more complex world through sense-enlarging instruments.
The natural force-fields have been "tamed", at least, conceptually.
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The difficult art of separating fact from fiction.
The unidentified flying object; a discussion.
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The nature of a fiery-red ball of light.
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The gigantic implications of accepting the existence of extra-sensory perceptions.
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The "anti-evolutionary aspects" of the concepts of ESP.
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Can animals and people communicate by sending and receiving electro-magnetic images or wave-patterns, like a television or radio set?
Can we detect a "carrier wave"? A simple experiment.
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The phenomena of premonition and "deja vue".
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The eternal hope to gain entrance to a meta-physical reality.
The logic of believing in ghosts.
The influence of beliefs on the interpretation of facts and the explanation of observations.
To make an inflexible judgement of "error" reveals an inability to see the relativity of a specific interpretation of reality.

One of the reasons, why it took such a long time before the methods of scientific investigation became really successful, lies in the fact, that man was limited to the information he could obtain with his naked senses, until he invented instruments that could enlarge the field of his observations and record them more precisely. In our modern times, we have great difficulties imagining what our reality perceptions would be like, if we did not have the help of such sense-
enlarging instruments. Even, if we are not familiar with the use of such
instruments, such as a telescope or microscope, a spectrometer, as well as all sorts
of metering and recording devices, we still absorb from our contemporary culture
numerous established concepts and ideas, which are based upon observations that
have been made with scientific instruments and emotionally neutral techniques of
investigation.

2 However, before the advent of these instruments and their profound
influence upon our reality perceptions, man could only know whatever he could
hear and see, smell and feel, and, we have seen, that this type of "primary sensory
interpretation" invariably gave rise to an anthropomorphic world of forces and
spirits. This meant, that man was surrounded by the same forces of nature as we
know them today, but these forces were interpreted in a way that differed,
especially, from the scientific interpretation.

3 Our modern scientific interpretations have "tamed" all these forces and
reduced them to a few predictable, and, often, static force-fields, but, for primitive
man with his primary sensory interpretations, the world was a complex network of
man-like or anthropomorphic forces and spirits. This world of arbitrary force-fields
was essentially unpredictable, because these forces could help or harm him "at
will", and, they could only be influenced by the same sort of mechanisms that
would influence the moods and attitudes of man himself. This is the reason, why
man tried to influence the world around him with the help of magical manipulations
and sacrificial rituals, designed to placate these unpredictable forces and bring
them on the side of the small community.

4 From this point of view, the practice of "judgement by ordeal" becomes
more understandable, because the outcome of an event was, often, seen as the
result of opposing anthropomorphic forces, and, it was assumed, that the good-
williing forces on the side of justice would, eventually, prevail. We have discussed,
before, the reasons, why we need such an essentially optimistic expectation of the
future, and, we can still see in our modern entertainment world, how strongly such
an expectation is present, because the "good guy" always prevails. It was,
therefore, not so illogical to assume, that the innocent party in a conflict would
have the stronger super-natural forces on his side, and, that the innocent party
would, therefore, be spared destruction in a judgement by ordeal, while the
"wicked party" would perish.

5 The world of primary sense impressions is quite limited, however, and
these limitations, resulting from sense impressions based solely upon the naked
senses, made interpretations often inconclusive. Unfortunately, without a complex
arsenal of instruments and a coherent structure of natural and predictable force-
fields, the interpretation of reality could, often, not be settled by logical deductions and arguments. We need experiments and other techniques to settle many questions of fact and interpretation, and, we know, how dependent we have become on sophisticated technological instruments in order to reach valid conclusions in the many fields of modern science.

6 If a visitor of pre-historic times would come back home, after having seen many other societies and communities, and, if he would tell about his experiences, it was impossible to verify the truth of his stories, because there were no methods to do so. Only, later, when many people could travel the same way and come back with essentially similar experiences, only, then, was it possible to separate, more precisely, fact from fiction, or, rather, it became possible to separate a more generally accepted interpretation of facts from a more personal interpretation of these facts. Only now, is it possible to make a clear distinction between an observation and its interpretation, but, let us demonstrate with a practical example, how difficult it is for us, even, now, living in a world of sophisticated science and technology, to make such a clear distinction between an observation, and its, often implied, interpretation.

7 For example, if someone reports an "unidentified flying object", he or she may give an accurate description of what was seen; how long it was seen; what it looked like; how it moved or behaved; whether or not there was any sound associated with it. Often, the description is so precise, so accurate and consistent from a number of observers, that a true physiological basis existed for the reported phenomenon. (We discount, here, the stories of dreamers or sensationalists, who have reportedly been aboard extra-terrestrial space-craft.)

8 As long as we state, simply, what we saw, and do not try to fit it into any particular known category, we are perfectly correct in our assumption, that we are stating facts, but, even, if we call it an "unidentified flying object", we are already one step too far on the ladder of unproven assumptions. We assume, then, that it was an object, and that it was flying. Both assumption may be incorrect because we are becoming more aware of peculiar, locally reflective characteristics of small columns of air, which may, for a short period of time, reflect light as a ball or as a localised, saucer-shaped object.

9 My wife and I saw, not so long ago, in the evening sky, looking north, a fiery red ball of light. Our observations were identical; we saw it at the same time, and, we saw it disappear at the same time. It was only present for a few seconds, and, it seemed to move slowly in a forward and upward motion. We have confirmation that something unusual could be seen in the sky, because someone walking by on the street, saw it too, and looked at it for a moment, until it
disappeared. The appearance of this fiery red ball of light was so short for this passer-by, that she probably doubted her senses and did not know, whether or not she really saw something.

10 This "observation" seems to fall into the category of the unidentified flying object, but I felt that the colour was identical to that of the setting sun, and, therefore, I interpreted the phenomenon as a local reflection of light by a column of air, even, if I am not sure of the mechanisms involved in this type of reflection. Perhaps, it is related to the "mirage", where a hot layer of shimmering air may reflect a certain landscape and may make it appear to lie within the limits of the horizon, while, in reality, the source of the reflection may be many hundreds of kilometers away.

11 People who have been schooled as careful and sceptical scientists, make, so often, the mistake to imply, or assume, that any observation which can not be easily explained, or, any observation that seems to run counter to the fundamental tenets of science, is "false", erroneous, or a deliberate lie. This is, not only, highly insulting to many people who are convinced that they saw or heard something that was there, but, it is a reflection of the fact, that, many scientists behave emotionally, and, that they have a tendency to reject or suppress, vigorously, any evidence that is confusing or unsettles comfortable scientific assumptions.

12 It is undoubtedly true, that, we all, scientists included, shrink back from admitting evidence that would profoundly alter the framework of our reality interpretations. For example, the "science" of para-psychology, as well as a whole host of para-scientific beliefs, flourish in the hands of those, who have, for one reason or another, accepted the possibility, that there may exist forms of knowing or communicating that lie "outside" the sphere of the known senses, but, at the same time, all their efforts and hard work to prove, beyond a shadow of a doubt, that they have demonstrated some sort of "extra-sensory perception", remains unconvincing, or, it is received with outright hostility by the "orthodox" scientist, who believes that all this ESP is utter nonsense.

13 Why is this? Why are there such fervent believers, and, why are there such hostile and emotional reactions to any evidence that is being presented? Again, the answer lies, basically, in the fundamentally upsetting consequences, which a general acceptance of the phenomena of ESP and related phenomena would bring with them, and, secondly, there is the difficulty for scrutinising scientists to distinguish, clearly, between observation and interpretation. For example, if a scrupulously honest and meticulous para-psychological worker has finally demonstrated with a, for him, remarkably air-tight and sound experimental technique, that extra-sensory perception or communication does exist, then, it
seems, that, to doubt his findings and conclusions, is to brand the experiment a fraud, and the experimental worker, a liar. If such a worker has staked his reputation on it, and, if he has invested a life-time of work in the pursuit of para-psychological hypotheses, then, it becomes difficult to scrutinise and reject his findings without touching a sensitive nerve.

14 Yet, the questions that arise are, indeed, so fundamental, that, any work claiming to demonstrate the validity of the phenomenon of extra sensory perception, should be able to discuss and answer the following objections. First of all; every shred of evolutionary evidence points to the fact, that the sense-organs arose as the result of a particular need. Extra-sensory perception seems to imply, that a form of sensation or perception is possible "outside" the known senses, but, it is unclear, what sort of a mechanisms is being postulated. Perhaps, at the foundation of these assumptions lies the knowledge, that the brain, as well as the heart and all other muscles, have a fluctuating electro-magnetic field around them.

15 This field is the result of the physiological activities that are taking place in these structures. It is also known, of course, that electro-magnetic waves are the source, and means, of man's ability to communicate over long distances, without any "visible connection". Perhaps, the intuitive feeling arose, that, nature must have made use of this sort of electro-magnetic communication, before man was able to design such instruments with his intellect. Is it therefore possible, that, people, and, perhaps, even, animals, can communicate in the same way; by sending and receiving electro-magnetic images or wave-patterns?

16 However, such an intuitive assumption does not take into account the fact, that the fluctuating electro-magnetic wave-patterns surrounding the brain and the skull, are nothing more than a non-specific resultant of all the cellular or neuronal activities that are going on inside the skull, and, these concepts ignore the fact, that the brain, nor any other organ, has anything like a transmitter or a receiver, as it has been developed in our electronic technology.

17 I have proposed, before, a simple experiment, which should establish, whether or not another individual can "sense" such a postulated "carrier-wave", coming from a "sending" individual. We leave, then, any specific content of a transmission aside. If it is, indeed, possible to sense, when an individual is "sending his thoughts", and, when he stops sending, of course, without any other possible clue about the occurrence of the initiation or cessation of a period of "mental sending", then, we may have a basis to start scrutinising, seriously, whether or not extra sensory perception is a valid hypothesis. However, as long as we have still so many difficulties separating a factual observation from its interpretation and potential implications, the "dialogues" between believers and non-believers in the
phenomena of para-psychology will remain acrimonious and, essentially, besides the point.

18 Let us concentrate, first, on a better understanding of the world of our perceptions, as well as the variability of our interpretations, before we tackle the possible existence of extra sensory perception. Let us acknowledge, that it is highly unlikely, that any form of extra-sensory perception exists, if we see how nature has to develop the tools and possibilities of perception and communication with a long and arduous evolutionary struggle. When we understand more about the many subtle forms of "sub-liminal" or sub-conscious communications that are possible, including the incidences of "parallel thoughts", or "parallel feelings", we may come to a better and more rational explanation of the many phenomena that seem to defy an adequate explanation at the present time.

19 If we hear someone swear to the fact, that he or she "knew", that a particular event was going to happen, we are always faced with the problem, that such testimony comes after the event has taken place. If someone is convinced, that a current event has already taken place, once before, exactly as it is happening now, we may invoke the explanation of a "deja vue" phenomenon. This can be explained as the result of a temporary lapse in discrimination, due to fatigue or drugs. The faculty of evaluation is, then, disturbed, and, it is not possible to differentiate between an on-going event and an analogous or similar experience of the past.

20 We all are easily touched, or excited, by the occurrence of something that appears mysterious. If we believe, strongly, in a world that goes "beyond" the world we can experience with our senses, (and the belief in such a world beyond or above the world of our senses is encouraged, in one way or another, by each and every religion), we can easily come to the conclusion, that there are ghosts, and, it is easy to conclude, that we have seen ghosts, or, that the souls of deceased people are able to haunt us, or a particular place. If we share such beliefs with our friends, we have no difficulty convincing each other, that we all heard or saw tangible evidence for such an interpretation of reality, because, after all, we interpret the stream of sense impressions according to the beliefs we already have.

21 Just as we can make a clear distinction in the observations of unidentified flying objects between the observation and its interpretation, so should we be able to distinguish between a real or "physiological" feeling, sensation or experience, and, an interpretation of this sense impression. I mean this; if someone tells us, that he or she saw a ghost, or, if an individual tells us, that he or she was shown a particular sign by God, or, if one believes in the ability to "know" something, before it was conveyed to the senses in a physiological manner, we can scrutinise
all such observations as a physiological or psychological phenomenon, excluding, of course, those which were deliberately or subconsciously "fabricated" and do not have any physiological basis at all. Rather than concluding, immediately, that such and such an experience is based upon an erroneous interpretation of reality, we would be wiser to study and record, carefully, when, and under what circumstances, and, amongst what sort of people and beliefs, these phenomena arise. The point is this; even, if an experience or mental image is not shared by others, the occurrence of a certain image, feeling or sensation may well be a fact for an individual, who is genuinely convinced of having received or undergone a particular experience, sensation or awareness.

However, the interpretation of this particular phenomenon may be completely different, depending upon the belief structures or the framework of reality perceptions of the interpreting individual. If we orden our interpretations, primarily, in a rational or scientific framework of beliefs, we will interpret phenomena within this particular structure, and, we will explain religious and para-psychological phenomena in a psychological framework of explanations, just as the religious person will interpret his sensations and experiences in the light of his religious and meta-physical beliefs. To make an absolute judgement of "error", reveals an inability to see the relativity of a particular interpretation of reality.

Chapter 4

Content

What is a "scientific reality", and, does it represent a "real truth"?
Observations based on shared physiological capabilities.
The "hard work" of verifying what others have discovered over a prolonged period of time.
The Philosophy of Science

The problem of specialised knowledge and expertise.
It is not a philosophical luxury to have a good grasp over all the sciences.
The profound influence of science and technology on our way of life, and our ability to survive.
A final flourish before a fatal crash?
In essence, all the force-fields of nature are regular and predictable.
The construction of a framework of "natural laws".
Slowly, the world of matter and energy began to yield to consistent efforts to create order and logical coherence.
The break-through of the "atomic model".
The various states of matter-energy.
The study of life-forms did not yield easily to the techniques of scientific measurement and description.
The unifying concept of "natural evolution".
The genetic spectrum, and the force-fields of natural selection.
Bold ideas, that arose, primarily, on morphological grounds.
My generation has witnessed a truly astounding expansion of scientific insights.
We have now a good scientific grasp over the phenomena of life and death.
Life is a matter of organisation.
A remarkable relationship between the worlds of living and non-living existence.
A fundamental sensitivity to "light", as well as other, subtle energy-gradients.
Sense-organs are elaborations of pre-cellular, protoplasmic characteristics.
The phenomena of human existence, including the faculty of conscious awareness, are coming within a sure scientific grasp.
A feeling for this gigantic web of togetherness.
A remarkable conceptual coherence.

1 "What is a strict, scientific reality?", you may ask, "and, is such a reality, then, the real truth?". Let us define, here, first of all, the most essential features of a reality perception that is considered to be "scientific" in nature. A scientific reality is based, ideally, on observations and conclusions which we all could verify for ourselves, if we wanted to do so, because the observations are based, solely, upon our physiological sensory capabilities, as well as upon a form of logic that is
The Irascible Personality

also based upon shared physiological or biological functions of the central nervous system. I mentioned, that these were the ideal circumstances under which a scientific reality perception could come to the fore, but, most of us lack the energy, the knowledge, or the incentive, to verify, and scrutinise, the many facts scientists have discovered over several generations.

Modern science has become so vast, and so complex, and, the modern techniques for investigating a particular problem or subject are so complex, that it takes many years of specialised study, and practice, to master a certain field. While it is understandable, that we can never hope to become an expert or research-scientist in a large number of fields, it seems sad, but un-avoidable, that, even, the basic scientific knowledge and understanding remains limited to a narrow spectrum of science and technology. This means, that scientific training is increasingly geared towards a specialised expertise, but, the question of overall scientific relevance, as well as the problem of presenting to the ordinary members of the social environment a coherent view-point of the overall goals of our scientific and technological efforts, have been neglected.

It is not a philosophical luxury to have a good grasp over all the sciences, because the results of scientific and technological efforts are, now, so profound, that the sciences, together with their technological applications, have become, at the same time, the most important life-line to secure our viability in deteriorating environmental conditions. At the same time, our technological mastery has also become the gravest threat to our viability, because of the possibility, and probability, of gigantic pollution and contamination problems. We have become, in essence, captive to our own inventiveness and drive to explore and develop all kinds of tools and weapons, but, let us realise, that this is not just a recent development. We have argued, before, that man became dependent upon his technological and cultural abilities from a very early stage in the evolution of Homo Sapiens.

We still have to learn to evaluate, properly, where the many contradictory and divergent tendencies are leading us. We still do not know, whether our contemporary turmoil is a phase in the emergence and development of a wiser, more stable and more equitable way of human existence, or, is the turmoil and upheaval, including the simultaneous development of marvelous technologies and dooms-day weapons, nothing more than a final flourish before the fatal crash?

However, let us not speculate, here, about the destiny of mankind. History shows us many reversals and re-births, and, it is too facile to predict, that the next set-back will be a final and catastrophic collapse. No doubt, the consequences of all-out warfare have rapidly escalated from the destruction of a small region and a
small segment of the total world-population, to the potential for a global devastation, pollution and contamination, which may overwhelm man's regenerative capabilities.

6. We should come back to the essence of the scientific way of thinking and investigating the phenomena of nature, and, we should review the application of scientific knowledge in the construction of instruments and machines, or, the manipulation of natural force-fields and events.

7. The essence of the scientific reality interpretation is the belief, and the attitude, that all the force-fields and phenomena of nature are, in essence, predictable in their actions and outcome. The fundamental feature of a scientific reality perception is the construction of a framework of "natural laws", capturing, in a conceptual form, the behaviour of natural phenomena. One of these "laws" describes the phenomena of random distribution, which we have described extensively before. The effort of capturing the phenomena of nature in a conceptual structure of predictable and recurring regularities, or "laws", is a slow and painstaking process, which is still far from complete, and, it is doubtful, that we will ever completely understand the phenomena of nature in such a coherent way, that the mental imagery and structures of explanation will remain static for a long time to come.

8. The efforts to formulate natural laws started, when man became more aware of the regularities of the many physical phenomena he saw around him. The motion of the sun and the stars, the regular "wanderings" of the planets, the recurrent changes in the face of the moon, the regularity of the tides, the fact, that all objects fall to the ground, and, that water dissipates and seeks its lowest possible level of existence; all these observations were a powerful stimulus to look for principles that would "explain", and capture in a predictable "law" or mental concept, the mechanical behaviour of matter.

9. Even so, the study and analysis of matter, as well as the formulation of predictable principles for its behaviour, did not progress very far, until relatively recent times, when a flowering of measuring instruments, the invention of optical instruments, and the sense-enlarging possibilities of the microscope and the telescope, as well as a more fundamental understanding of the nature of matter in the form of molecules and atoms, began to create order in what had always appeared to be a large and incoherent mass of separate and apparently unconnected behavioural properties.

10. Slowly, the world of matter and energy began to yield to the efforts to create order and logical coherence, and, rapidly, a more coherent way of looking at
the world of inorganic existence began to take form. A gigantic break-through occurred, when the atomic model evolved, creating an orderly hierarchy of the basic elements of nature. These elements could then be arranged in a natural hierarchical order of increasing weight and concentric layers of orbiting electrons.

11 Another epochal advance in our understanding occurred, when we realised, that the electro-magnetic wave-form was the fundamental corner-stone of the phenomena of energy as well as matter. We realised, then, that energy could exist as a "radiant" form of energy; as a propagating wave-front, or, as an "orbital" or "locked-up" form, which exhibited the properties of mass and gravitational attraction, or "matter".

12 The primary orbital matter-energy forms that were able to evolve in "outer space", (primarily the constituents of the hydrogen atom), would, eventually, be transformed into a variety of stable elements within the interior of large stellar aggregates with their natural nuclear-fusion reactors. Here, in a nut-shell, we have sketched the evolution of our concepts about matter and energy, which tie the phenomena of the inorganic world together, to an extent, and a measure of cohesion, which mankind has never possessed before.

13 The success story of science began in the world of inorganic existence and the measurability of many of these phenomena made it possible to describe them accurately. The ability to measure made it possible to check quantitative relationships and to represent these relationships and events in mathematical symbols and concepts, or "formulae".

14 In the study of life-forms, scientific efforts remained, for a long time, confined to the tasks of description and classification, but, even so, when man started to compare the many similarities, as well as the gradual differences between the many species', an audacious concept arose, which suggested that one species may have evolved from another, by a process of "natural evolution". The basic idea was, that the living organisms forming together a particular species, would present a spectrum of slightly varying capabilities and morphological features to the forces of nature. This variability was made possible by the sexual mode of reproduction.

15 If a species was subjected to severe pressures upon its existence, only a small fragment of the spectrum of variability of a generation would reach maturity, and, the next generation, or the next spectrum, would come from this most successful segment. In this way, "natural selection" and survival of a small segment of the genetic spectrum, presented by a specific generation, would allow the accentuation of properties and features that were desirable, and would enhance
viability, while those features, which did not contribute to survival, or were a liability, were weeded-out.

These bold ideas arose, originally, primarily, on morphological grounds, but, the mechanisms, whereby such naturally selective processes could take place, were hidden from view, until contemporary advances were made in the study of cellular and biochemical mechanisms. My generation has witnessed a truly astounding unfolding of scientific insights. Not only, have the concepts of natural evolution been substantiated, again and again, but, the mechanisms of reproduction, as well as the formation of a genetic spectrum have been clarified. Now, we have, or, we could have, if we bothered to study and think about all these phenomena, a coherent view of the living organism.

We have a good idea, or, at least, we have a reasonable imagery, how the living organisation arose in a prolonged and gigantic natural experiment with biochemical evolution. Certainly, we do not know details, because very few records have been preserved from this period of biochemical or pre-cellular evolution. However, we have, now, a good grasp of the workings and mechanisms of the biochemical processes of the living cell, and, we have come to appreciate the fact, that the living organisation is a dynamic, labile and constantly fluctuating conglomerate of fragile biochemical reaction-patterns, which require, constantly, a minimum flow of energy in order to preserve their integrity, their labile but reactable state of existence, as well as their dynamic relationships.

As soon as we realised, that life is a matter of organisation; that it is a principle of togetherness, where a system of reactable substances is sensitive to minute environmental changes or stimuli that can not be react-ed to by the more stable, inorganic forms of matter, we began to connect the world of living existence with the world of in-organic or non-living existence.

It is astonishing to see, to what extent we can, now, relate these two worlds of organic and in-organic existence. It is true, that the living organisation introduces a variety of special characteristics that distinguish the living from the non-living organisation. These are characteristics such as reactability and irritability, the ability to move, or, the ability to change chemical reaction-patterns in response to mild, chemical, thermal or mechanical stimuli. There is the ability to form complex, multi-cellular organisms, where the basic characteristics of the living protoplasm are elaborated into special sense-organs, etc., etc.

As we have discussed many times before, the sensitivity to light is a fundamental characteristic upon which the evolution of pre-cellular biochemical organisation patterns, rests. Therefore, the ability to form special sense-organs that
are sensitive to electro-magnetic wave-fronts, the sense of vision, to slight mechanical changes, hearing, or to chemical tracer-substances, smell, are elaborations of capabilities that were already a fundamental characteristic of the pre-cellular evolution of the protoplasmic primordium.

21 We have also discussed the fact, that the abilities of thought, conscious awareness, conceptualisation and verbal communication, are natural consequences of the evolutionary trends of behavioural flexibility and voluntary memory-recall, and, we have therefore developed, at least, an intuitive feeling for this gigantic web of togetherness and cohesion that spans the entire "Universe of Existence"; from the electro-magnetic wave-front, the radiant and the orbital energy-forms, the elements and their intra-stellar evolution; the origin of the planets and their physical constants, which led, at least, here, on earth, to this gigantic experiment with biochemical and cellular evolution.

22 However, the web of coherence does not end there, because we can now trace a coherent line of development; from the single, independently metabolising cell, through multi-cellular organisms, to the mammals and the behaviourally flexible species', and, eventually, to the anthropoids and the sole survivor of the species' that experimented with memory-recall and symbolic representation; the species of mankind.

23 We see, then, a continuous line of development; from inorganic existence, through the peculiar characteristics of the living organisation, to the behavioural capabilities of the flexible animals, as well as those with the capability of voluntary memory-recall, symbolic representation and conceptual communication. This means, that there is a continuous and flowing line of existence that connects, not only, all the phenomena we can see on earth, but, this line of existence connects also with our own existence, including our specifically human capabilities of conscious thought and awareness.
Chapter 5

Content

The difficulties associated with teaching a coherent perception of reality.
Letting-go of anthropomorphic images and explanations.
Taking the circumstances we find ourselves in, for granted.
A natural emphasis on adapting to "the facts", rather than inquiring about the reasons for their existence.
The logic of the concept of creation.
God, seen as the "Prime Mover".
Our affinity, or "feeling", for an interminable series of causes and their effects may lead us astray, at times.
Existence can not come from non-existence.
Where does matter-energy come from, or, where does God come from?
The difficult concept of "always".
An audacious assumption, and the consequences of our "sense of mystery".
The emergence of a "hybrid" belief structure.
Leaving room for some sort of anthropomorphic reality perception.
The disadvantages of a scientific schooling that is too narrow.
The failure to see science in an overall and far-reaching perspective.
The consequences for our reality perceptions, whenever we are able to see ourselves as a product of natural evolution.
The inevitable conclusion that a condition of "truth" is a relative judgement.
Experimentation, demonstration and verification are powerful methods of persuasion.
Taking a good look at intuitive and somewhat emotional conclusions.
The illusion of having come closer to an ultimate truth.
A sobering look at scientific history.

1 I do not want to suggest, for one moment, that I have been able to trace this continuous line of coherent awarenesses, which links our own existence, and our particular as well as peculiar capabilities of conceptual thought, with the world of physical existence around us. It will be the major task of future curricula to teach this link at school, and, to make people, at least, somewhat aware of this link between ourselves and the world in which we live. Let us not under-estimate the difficulties of providing such a coherent picture, and, let us review, here, what sort of difficulties there will be, and, why, because of these difficulties, the religious reality perceptions are likely to remain attractive and predominant.

2 The peculiarity of the scientific view-point, and, in particular, the concept of an ultimate, natural link between ourselves and the world of physical existence, lies in the fact, that it denies the existence of an anthropomorphic creative act, which has always been invoked to explain our own existence, our ability to think and speak, as well as the myriad of existence forms we can see. Indeed, before man had the ability to form some sort of an evolutionary imagery, he had to assume, that the items of existence he was aware of, were created, just as he could create objects and bring them into existence, like a tool or a weapon.

3 Let us remind ourselves, that the question where something "comes from", is a relatively late one. Only, after man had already developed some sort of a belief structure connecting many causes and their effects, did man feel the need to wonder about the existence of some-one or some thing, asking himself, how, or why this existence came-about. Animals take the environment in which they find themselves, "for granted", and, their behavioural responses are based upon the "given" circumstances of the moment. Their existential concerns may involve the problems associated with their own needs and motivations in relation to the environmental circumstances as they exist, but, an animal does not concern itself with the question, how something came to be the way it is.

4 Even, man has a strong tendency to accept the realities "as they are", and formulate a response from the given circumstances. We have seen, that the ability to finely tune a behavioural response in accordance with the prevailing circumstances, includes the need for a refined analysis and perception of the way things are, but, the question how did things become that way, is irrelevant for an animal without power to change the situation "as it is". Such an animal can only adapt, passively, to changing conditions.
After man had developed a great deal of active manipulative capabilities, he was able to influence the environment in a deliberate manner, and, it was logical that man began to ask questions about the reasons and background from a situation "as is". He felt a need to "explain" a particular situation. A satisfactory explanation would increase his powers of prediction and manipulation over the environment, and, this is the reason, why man started to formulate a belief structure with a framework of causes and effects. Such a structure of explanations would explain, not only, his own existence, but, also, the existence of the world around him.

Naturally, the only possible explanation was some sort of a creative act by a spirit, or a god, because the concept of evolution is a modern and sophisticated explanation that is, even, now, difficult to grasp and prove. However, as man's mastery and predictability improved, the anthropomorphic features of a force, or an event, declined in importance, and, eventually, the concept of a Creative God coalesced into a monotheistic form, where God became far removed from the occurrence of routine events, and, in essence, God became an inscrutable Force or Power.

This "retrenchment" of the concept of God found its ultimate expression in the idea of a "Prime Mover", where the creation of the world of existence itself had to be explained on the basis of a creative act, (because something can not come from nothing in our rational world of causes and effects), but, after the initial creative act, the Prime Mover would not influence, any further, the series of causes and effects that would naturally flow forth from this Primeval Act of "setting the Universe into motion". This concept preserved the obvious evolutionary features which scientists were discovering all around them, and, yet, it answered this perplexing question what there was, before matter-energy existed, or, where matter-energy "came from".

However, as we have argued before, our "feeling" for an interminable series of causes and effects, leads us somewhat astray, here. It seemed logical to ask the question, where matter-energy came from, because we assume, in an evolutionary way of thinking, that all existing forms have come from something else. Yet, we have also learned to appreciate the fact, that existence evolves and changes continuously, but, never does anything arrive or come "from nothing".

This means, that, in our way of thinking about time and duration, matter-energy has "always" existed. In essence, the "solution" of having matter-energy created by God to get out of this dilemma "where it all came from", is intellectually a rather superficial solution, because the question immediately poses itself; "where
does God come from?”. However, this question is somewhat muted and defused by the fact, that the concept of God appears to stand outside the chain of causes and effects; if God is an all-powerful and a mysterious Creative Force, it seems irreverent, and illogical, to ask the question, where God came from. Yet, stripped from this aura of mystery and the attitude of humble reverence, the question surfaces again, and, it can only be answered by the statement, that God has always existed; at least, so far as we can fathom God's existence with our meagre capabilities of understanding.

10 Such a humble attitude towards the capabilities of understanding is also helpful in scrutinising our assumptions, because, only, if we are willing, time and again, to think, carefully, about our assumptions, and, to question the validity of these assumptions, only, then, can we expect to make slow progress on the road towards a better, more harmonious and more generally acceptable way of interpreting reality.

11 It is necessary, here, to scrutinise, or discuss, this fundamental, but, often, tacit assumption that underlies the concept of "strict scientific thought". This is the assumption, that, all anthropomorphic forces have fallen-away from the observable Universe, including the world as we can see it or imagine it to be. It is, indeed, an extremely audacious assumption to believe, that we can fathom all existence, including that of our own and the faculty of conscious thought, as a result of natural evolutionary processes and ordinary physical laws.

12 Somehow, this conclusion seems illogical, boastful and highly improbable to us, in particular, if we do not have a clear mental picture of this "continuous line", we mentioned before. Most of us have too strong a "sense of mystery" to allow ourselves such an apparently over-confident and un-warranted conclusion. The reality perceptions, or, rather, the belief structures of most people, including those, who are schooled in a field of science, are, therefore, "hybrid" in nature.

13 We mean by this, that the beliefs of most intelligent and scientific people include a "strictly" scientific approach and attitude towards the field in which they have been trained and work professionally, but, in their interpretations of the numerous realities that fall outside their particular sphere of experience, these scientists and professionals adopt the logical and humble attitude that "leaves room" for, at least, some sort of anthropomorphic reality perception. They are so well aware of the enormity of the total sphere of knowable reality, and, they are so well aware of the miniscule significance of their own particular field, that they find it difficult, or, even, preposterous to extrapolate the "strict" scientific conclusion, which postulates the absence of an anthropomorphic force for the entire observable Universe.
Here, we see, what happens, when we train people to become only experts in a particular field. While it seems reasonable to be humble and to be sceptical about this essential scientific conclusion, it is, nevertheless, remarkable, that most scientists do not seem to appreciate the fact, that the methodology and the fundamental conclusions that lie at the foundation of their particular spectrum or field of science, also apply to the other fields, even, if they do not have an overview of these fields. Because we do not see the scientific reality perception, anymore, in an overall and far-reaching perspective, we, are tempted to use the limited field of expertise only as a way to function in society, and, "make money". For the rest of our interactions with reality, and with other people, we behave, then, as "un-educated" lay-people, who react according to primary sensations or prevailing moods and opinions.

Certainly, it is extremely difficult for those scientists, who are not schooled in the life-sciences and the physiological mechanisms of the human being, (including the functions of his senses, his mental abilities and cerebral structures), to see, or appreciate, the existence of this essential link or line of continuous development we talked about, and, any suggestion that such a link exists will be treated with scepticism and will be considered as "un-proven".

However, the most remarkable, and, probably, most far-reaching consequence of seeing ourselves as a product of natural evolution, is the effect such a conclusion has upon the nature of our scientific reality images. As soon as we understand, fully, what this means, we come to the conclusion, that, therefore, all our concepts and ideas about the way nature, and, we, ourselves, exist, are the result of peculiar and specific capabilities, which the forces of natural selection have evolved for the species' of life in order to help them in their struggle for survival. The consequences of such a concept are gigantic, because they show us, clearly, that, verbalisable, conceptual consciousness is a human tool for survival, or destruction. This means, that the reality images we construct about the world we live in, the world of our own existence, as well as the way we think, know and behave, are mental images, which may, occasionally, become extremely persuasive and widely accepted.

What is true, becomes, therefore, a function of the degree to which a mental image, a concept, or an explanation, has been accepted, and, indeed, if we look, closely, at the realities of science, we see, that, they only become realities, after a significant number of people have been persuaded to accept a particular mental image as "true". The methods of persuasion are experiment and demonstration, the verification of an experiment by re-duplication, or the confirmation of a description by a number of independent observers. These processes may, occasionally, become so powerfully persuasive, that we have the
feeling to have, finally, "uncovered" the truth "as it really exists". However, a hard and sober look at such an intuitive and somewhat emotional conclusion, based on exuberance and confidence, shows us, that our intuitive conclusions are misleading.

18 Certainly, our increased mastery over the environment seems to indicate, that we have come, at least, a step closer to discovering the ultimate scientific truth, or reality, and, indeed, certain concepts and reality interpretations may become very durable, and may become accepted world-wide. This gives us the impression, that we are dealing with an absolute truth which we have finally discovered, until, suddenly, a new twist, a new piece of evidence, or a new way of looking at reality, casts an entirely new light on the phenomena we thought to have understood in their ultimate fundamentals.

19 A look back at scientific history shows us, clearly, how ideas and concepts of realities evolve, and, it shows us, that we can never be sure to have found an "absolute truth". As we will argue in the following chapters, we are now beginning to appreciate some of the peculiarly focussed aspects that are associated with each and every attempt by man to understand and explain himself, or the world in which he lives. Besides, the final argument goes as follows; if we agree, that all our concepts and ideas about the realities in which we live, are mental images or complex mental structures, we can not know, by definition, something that is not grasped and mastered by our human way of "cerebralising realities". If we do not know anything "absolute", how can we judge, then, whether or not an interpretation or understanding has come closer to this absolute reality?
Chapter 6

Content

Reviewing the various arguments a little more slowly.
The many aspects of "change".
The concept of "entropy".
Organisation breathes life into essentially lifeless elements.
Signs of evolutionary change are everywhere.
The world of "boundary reactions" between orbital electron-shells of atomic elements.
Scientific knowledge is a product of our living existence and existential needs.
Manipulability and predictability do not necessarily imply a full grasp over the items we manipulate and predict successfully.
The nature of knowledge.
A brief over-view of what we know about the world around us.
The building-blocks of concepts and ideas, represented by mental images.
Many levels of awareness.
Can time be reversible?
The need for certainty, and the inclination to "jump to conclusions".
We never have complete mastery or predictability over the phenomena we are involved with.
The temptation to ignore discrepancies.
The need to discover "something new".
Why our activities depend on the circumstances we find ourselves in.

Let us go over these arguments a little more slowly. As we build-up a coherent reality perception with the scientific methodology of observation, verification, experimentation and discussion, a gradually enlarging field of coherent

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relationships emerges. From an intuitive conclusion, that an apparently immobile or incomprehensibly complex item of existence had to be the result of an intelligent, anthropomorphic act of creation, we see the emergence of a flowing spectrum of ever-changing relationships, where the existence of anything at all, can be traced through some sort of an evolutionary history. Even mountains and continents, the seas, as well as the planets and stars, have yielded to a reality perception, where their existence can be sketched as a particular moment in the history of their birth, growth, development, maturity, decay and death.

2  This does not mean, that, all inorganic existence has acquired the properties that were thought to be the exclusive domain of the living organisation, but, it has helped to bridge this apparently enormous gap between the living and the non-living items of existence.

3  While the apparently static immobility of many in-organic forms of existence has been replaced by a more dynamic imagery of change and evolution, the living organisation has yielded to an analysis, that lets us see the essence of the living organisation as a complex system of fragile and labile molecular substances, which will run-down to their lowest level of energy-existence, unless replenished, protected, sheltered or rebuilt in a coherent unit, requiring, for these reasons, a constant source of suitable energy. Without energy the unit would be unable to maintain its coherence and fight the natural tendency of "entropy".

4  Entropy is the tendency to run-down the scale of energy-relationships, and a reactable substance will, then, come to rest at the lowest possible level of existence, just as water runs-down to its lowest possible level of gravitational energy. The most surprising conclusion of the study of life has been, that, all these remarkable properties of the living organism can be traced to the possibilities of such an unstable, fragile, biochemical conglomerate. This means, that there is no specific principle at work "breathing" life into essentially life-less elements. As a result of these studies and insights, we can now trace, be it in overall outlines only, and with many important gaps and irregularities, a picture, that lets us see how radiant and orbital electro-magnetic forms of energy can exchange their mode of existence, and, this imagery provides a crucial link between matter and energy, which is so necessary to come to a coherent view of the Universe.

5  We can imagine, in a sweeping and daring, but, nevertheless, incomplete view, the transitions between radiant energy and matter. We can visualise the build-up of huge gravitational units; the contraction of "matter", the production of enormously high pressures and temperatures, which disrupt, again, the orbital forms of matter-energy and convert this energy, partially, back into radiation, and, partially into more complex orbital complexes. This basic imagery lets us see the
evolution of a large variety of natural elements, depending upon the size of the stellar nuclear furnace and the range of temperatures and pressures that exists at the site of a particular process of intra-stellar nuclear fusion. This allows us, in turn, to visualise the birth of the solar system and the planets, and, it explains, why the earth contains so many different and predominantly heavy natural elements.

6 The world of "boundary reactions" between the outer orbital electron-shells of a variety of atomic elements, gives us a feeling for the happenings and reactions that are possible between them. This is the field of chemistry. From here, we can visualise the conditions of the early earth, as well as the reasons, why the circumstances happened to favour this gigantic biochemical experiment that led, after a billion years or so, to the independently metabolising cellular unit. From the single cell, we can trace, more or less harmoniously, with the help of a variety of "evolutionary principles" and fundamental concepts about energy relationships, the peculiar characteristics and possibilities of behaviour, which flourish, so dramatically, in the complex, multi-cellular life-forms. We have discussed, on many occasions, these developments in more detail, and, we are, here, only interested in the barest of outlines, in order to recall what we have studied and discussed before.

7 I would like, here, to concentrate on the remarkable results flowing from the ever more compelling view-point, that the human being, or, rather, the species of Homo Sapiens, is just one of these naturally evolved life-forms, and, that our abilities to learn, to know, to form concepts and to develop such a sweeping but coherent view of the realities around us, are also a product of natural evolution.

8 As we learn more about the way we behave, how our sensory mechanisms and organs work, and, how our cerebral computer puts-together a harmonious and coherent response to the circumstances in which we find ourselves, we also learn to see, to what extent knowledge, including scientific knowledge and reality images, are a product of our living existence and our existential needs. It seems, then, that our sweeping and coherent view of the realities around us, is more a reflection of the way we, with our sensory and cerebral capabilities, inter-act with the environment in which we live, rather than a reflection of the "truth" as it really exists, independently from our own existence.

9 It is such a natural and intuitively unshakable conviction to believe, that a highly successful imagery of the realities around us, reflects, in close likeness, the reality "as it really exists", and, we all feel a sense of incomprehension and irritation, if someone tries to argue, that such is not the case. In particular, the high level of experimental predictability and technological mastery seems to suggest, that we have discovered, finally, the truth "as it really exists", but, as we have argued before, a few decades later, or a look at our attitudes and convictions a few
decades or a few generations ago, shows us, that man was just as confident, then, about possessing the truth as he is now, and, yet, we can see, clearly, how quickly, and, how fundamentally, these scientific reality perceptions can change.

10 If we are careful and honest, we have to say to ourselves, that a highly successful scientific reality interpretation, together with a highly convincing technological mastery over a variety of natural phenomena, gives us, indeed, the "feeling", that we have finally probed the reality "as it really exists", but, a close look shows us, also, that we manipulate many phenomena with great confidence and predictability, without really knowing or understanding the details of what we are manipulating. We can build sophisticated machines, manipulate billions of electrons at the same time, and, we can transplant, or replace, a variety of vital organs in apparently spectacular scientific and technological success stories, but, still, we have only a vague idea, what an electron, an atom or an electro-magnetic wave-front really is. We have only vague ideas, what is really happening on a cellular and molecular scale, when we manipulate and change physiological and anatomical relationships, so drastically.

11 As a matter of fact; if we think about it, carefully, we realise, that all knowledge is nothing more than the structuring of a coherent framework of relationships, where we orden the pattern of building-blocks. We can, then, predict, or anticipate, quite well, but, never completely accurately, the outcome of events and happenings on the basis of "operating principles" that govern the behaviour of many entities of existence. All knowledge makes use of building-blocks, but, the nature of these building-blocks remains a mystery, or, at least, we have to shrug our shoulders, somewhat impatiently, when someone asks, what these building-blocks are, and, where they came from.

12 The sweeping view of the Universe, the planets and the evolution of life on earth, gives us, now, a somewhat coherent view of the relationships between radiant and orbital forms of energy, the build-up of natural elements with their remarkably variable chemical and physical properties, as well as the evolution of the possibilities of the living organisation. They all are a result of the properties of sub-atomic, elemental or biochemical substances and their individual characteristics. However, we can not answer the question, what an electro-magnetic wave-front is; where it comes from, or, rather, where energy-matter came from.

13 We have some idea, how the properties of atomic elements relate to their mass, nuclear structure and the electron clouds that encircle the atomic nucleus, but, this does not mean, that we can explain what gravity is; what electro-static
force-fields really are; how the strong and weak inter-acting forces between the nucleons within the atomic nucleus carry-out their binding or cohesive functions.

14 We have some ideas, how the forces of nature relate to each other, and, we have a strong, instinctive tendency to reduce the number of separate and apparently unrelated forms of existence. This is the reason, why we find it "beautiful or satisfying", if we are able to relate all these forces into a uniform theory of force-fields. Probably, we will, eventually, build indeed an imagery that unifies the concepts of force, of energy and matter, as well as of existence itself, and we will, then, possess an even much greater clarity of the scientific realities than we have now.

15 However, I would like to emphasise, here, once again, that the nature of human knowledge is such, that we build-up a framework of coherent relationships with "building-blocks". These building-bocks may eventually be entirely comprised of the electro-magnetic wave-front and its properties, but, regardless of the fundamental building-block we use, I can not imagine a structure of knowledge and understanding that does not use some "given entities", whose existence and properties will remain, essentially, outside our sphere of comprehension.

16 We see, clearly, the many difficulties we already have, if we try to extrapolate a chain of causes and effects to a scale of enormous or "infinite" dimensions, at the extreme ranges of time and space. We see, how we grapple with the concepts of time and space; how we have tried, rather unsuccessfully, I may add, to equate the dimensions of time and space in a space-time continuum. The essential problems associated with such a concept of a space-time continuum, is the fact, that events evolve or happen along an energy-gradient; from a higher to a lower level, because this gradient is the driving force of the event. If we visualise time to be reversible, just as the spatial dimensions are reversible, we run into the problem, how to explain the occurrence of a phenomenon "up-hill", so to speak, against the concentration or energy-gradient fueling a particular event.

17 Let us come back to the conclusion, that it is rather superficial and thoughtless to conclude, intuitively, that our scientific and religious certainties must reflect the knowledge, or understanding, of absolute or divine realities. We "know", now, from our biological studies, that the living organism, in particular, the complex, behaviourally flexible and conceptualising human animal, needs a great deal of "certainty", in order to be able to formulate a useful behavioural response. Even, our intuitive search for simplicity and harmony in the construction of our beliefs and reality interpretations, is fueled by this same existential need. Whenever our beliefs become more coherent, the realities become more predictable, and, we find it easier to formulate a suitable response.
Therefore, the human being is constantly grappling, at least, intuitively and sub-consciously, with a dilemma. He needs certainties, and, he is always tempted to "jump to conclusions". He is always tempted to believe, that he has found the truth, or, that he has developed a coherent picture of reality. Such a certainty gives him confidence, and the attitude of confidence may enhance his viability. However, any belief structure, be it a simplistic and absolute belief, or, a more carefully constructed, complex, scientific framework for our reality perceptions, gives us never a complete control over our environment, nor, does it give us a complete or perfect predictability over the phenomena we are involved with. We have a choice, then. Are we going to suppress these minor and irritating exceptions and contradictions of our expectations, and, are we going to ignore them completely, or, do we start to rethink and rebuild our reality perceptions, and try to incorporate these discrepancies?

The answer depends upon the circumstances we live under. If we happen to occupy an academic position as a professional scientist, we make a living from making observations and trying to discover "something new". Then, we will spend a great deal of time and effort debating and discussing our findings with our colleagues, and, if we are able to convince our sceptical colleagues, eventually, that we have, indeed, discovered "something new", and, that a small detail of the reality perception of our particular field has to be revised as a result of our work, we feel a great deal of personal satisfaction, as our prestige and academic standing have been enhanced.

If we happen to be a lonely philosopher, who can afford the luxury to live in a state of frugal retirement, without the need to make money, impress colleagues or collect grants, then, it is possible to study and scrutinise the entire field of our reality perceptions. Then, it is possible to reconsider the mechanisms of perception, thought and knowledge, and, to write numerous essays, one after the other, without any realistic prospect that these writings will be useful to anyone else.

However, if we happen to have the misfortune to be caught in a period of great social turmoil or belligerence between sovereign nations, we may find ourselves on the battle-field, somewhere, with a machine-gun or a grenade-launcher in our hands, ready to tear apart the flesh and life of our un-seen and unknown adversaries. Then, we can only hope to survive. We can only hope, that we will be able to kill and destroy our equally prayerful and hopeful adversary at the other side of the battle-field, before he kills us.

We can only hope, that our acts and deeds of patriotism will find favour with the political and military leaders who send us into battle, as well as the friends
and relatives we left behind and may never see again. Finally, we can only hope, and pray, that our soul will find Grace and Acceptance by God, if our time has come to die, and, we can only hope, and pray, that our Lord will not hold it against us, that we have ripped the flesh of other bodies; that we have killed and destroyed other children of God, because, after all, we do not really understand, what the war is all about, and, how we came to be in this situation, where we can not throw-up our arms and refuse to fight any longer.

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Chapter 7

Content

The "organic" nature of beliefs and interpretations.
The human nature of "extra-polated realities".
The peculiarly human activity of making use of "summarising concepts" represents an important "anthropomorphism" in our reality perceptions.
Multiple layers of reality.
Micro-scopic and "mega-scopic" worlds.
An uncomfortable perception of reality.
We all become "set in our ways".
Making a living from a little knowledge.
Can a scientific reality perception answer questions of a moral or ethical nature?
The ability to interpret conflict-situations as a result of natural, logical and fully understood competitive drives.
When we become polarised and emotional.
The relationships between prey and predator; the advantages of an unequal power-struggle.
The species of mankind displays an
The main result of our scientific observations, as well as the construction of a sophisticated, but smoothly flowing framework for the classification of our sense impressions, is the conclusion, that, our beliefs and reality interpretations are behavioural tools. The growth, maturity and rigidity of our beliefs parallel the growth, maturity and rigidity of the rest of our behavioural attitudes, and, these mechanisms reveal, clearly, the "organic" nature of beliefs and interpretations. We know, now, that the apparent correlation between successful scientific interpretations and manipulations is an illusion, and, this is made clear to us, when we compare man's confident attitudes and rigid beliefs with the changing patterns of these beliefs, when compared over a period of time.

We have also alluded, briefly, to the fact, that, by definition, knowing or imagining is an act of the human mind, and, that, therefore, any concept or reality that is imagined to be "external" or independent from human existence, is still an act of the human mind. The necessarily human nature of the reality-image of something, we think, is a reality beyond and above human knowledge, makes it clear, why we have such a great difficulty acknowledging the anthropomorphic features of our reality perceptions.

We have discussed the slow retreat of anthropomorphic explanations in the belief-structures of man, as the nature of forces and events became a chain of understandable causes and their predictable effects, but, there is an even more pervasive and hidden anthropomorphism in our reality perceptions. We have discussed these aspects extensively before, and, we will, therefore, only recall the main lines of thought.

For example, when we scrutinise the way we form knowledge, concepts and ideas, we see, how much our mind is involved in a peculiarly human activity of "summarising". We have to "grasp", literally, "hold-together", the myriad of separate and identifiable awarenesses in a single concept. This concept represents a unified or grasped mental imagery, and, we have argued, that such a conceptual view of reality is a biological necessity, in view of the limited number of awarenesses we can handle at any particular time. Yet, if we do not keep this remarkable focussing or bundling action of the human mind "in mind", we forget, or fail to see, an important "anthropomorphism" of our reality perceptions.

Related to this focussing action of the mind, whenever we form concepts, ideas and abstractions, is the fact, that, "multiple layers" of reality, or, multiple
worlds of existence have evolved, in particular, after the emergence of sense-enlarging, scientific instruments. Our scientific beliefs and reality interpretations incorporate, now, automatically, many different worlds, beyond the one we can see and hear with our naked senses. At least, we are potentially able to take these various microscopic and "megascopic" worlds into account, if we have been exposed to them in a good educational program.

6 Many people have great difficulties visualising these worlds, because most people find it difficult to grasp the worlds of chemistry, of molecular and atomic interactions, of sub-atomic particles and force-fields, or, the world of the cell and its numerous protoplasmic organelles, the world of multi-cellular existence, or, the worlds of the stars, the planets or the solar system.

7 Unless we make an effort to develop a particular capability and find some use for it, the capability or potential will wither-away, and, if the people in society are exposed to a rather primitive or defective educational program, where the world of the sciences fails to make an impression, we see, that the world of primary sense-impressions, including the religious and traditionally transferred beliefs and opinions, becomes dominant. A more sophisticated reality perception is then suppressed, because people feel uncomfortable with it, whenever they are exposed to such a reality perception at a later age. They feel it as a challenge to the beliefs that have already crystallised into comfortable certainties, and, besides, if people have lived a large part of their lives without a complex and sophisticated reality perception, they will manage the rest of their lives, also, without it. People, who live under relatively stable conditions, rarely feel the need to change their perceptions of reality at a later age, because, we all have a tendency to become "set in our ways". This, by the way, is, once again, an indication of the organic nature of our beliefs and opinions.

8 The religious reality perception gives ample opportunity to cope with a period of adversity. Actually, a religious reality is, nearly always, more attractive and convincing than a scientific reality perception, whenever the circumstances have become more difficult and an atmosphere of chronic anxiety has been established. Our religious beliefs give plenty of scope to feelings of guilt and repentance, and, we see, often, a remarkable level of resilience and innovation on the basis of a religious belief, especially, during behavioural adaptations to conditions of chronic stress, while a scientific reality perception is, so often, used as a tool to get a well-paying job; to become an expert or a professional. Yet, at the same time, these possibilities of science and technology are, often, frightening to those, who have little knowledge about the sciences, because they are used, not only, as a means to "make a living", but, the military and political leaderships of
society use these possibilities, also, blatantly for egocentric or "socio-centric" purposes.

9 This brings us to the final, and, perhaps the most important point in our discussion about the philosophy of the scientific reality perception. This is, the question, how the scientific reality can answer questions of a moral or ethical nature. These are questions that concern themselves with the problems of conflict and strife, as well as with the need to survive in a mode of social harmony, rather than the solution of armed combat. Our scientific methods of observation, together with the insights gained from studying the phenomena of life, show us, more clearly than we ever could see before with our religious reality perceptions, how our behaviour and our beliefs are inter-twined, and, how these beliefs and behaviour-patterns center around our existential requirements. The major, and, perhaps, crucial advantage of a scientific reality interpretation, is the ability to interpret conflict-situations as the result of a natural competitive drive, in particular, between organisms with identical needs.

10 Reflecting upon a conflict-situation, in particular, if we are not involved ourselves, allows us to analyse the history leading-up to a conflict. We can see a gradually escalating atmosphere of rivalry and belligerence, where the beliefs and the attitudes of the opponents become polarised around their respective interests. This means, that the rational, explanatory faculties are used to support an emotional stance, and, this happens, also, if we have become embroiled in a situation of conflict ourselves.

11 Invariably, we feel to have been wronged, now, or in the past, and, we justify our actions and attitudes in the light of our moral and religious convictions, or, on the basis of our national pride. Or, we see ourselves, simply, as champions of a just cause, often, commanded by our God to defend the Faith, the honour of the Fatherland, and, to destroy our hated enemies; those, who are enemies of the righteous children of God, and of God Himself.

12 It does not really matter on which side of the conflict we look, because it is clear, that both sides are gearing up for a confrontation, and, it is obvious, that both sides are mustering all their psychological, rational, emotional and military resources to fight a battle, which seems to become increasingly inevitable.

13 This is an outline, in general terms, of the polarisation that takes place between two, large, hostile groupings, which are more or less equal in power. Often, a nearly equally balanced military might will inhibit an outbreak of outright hostilities, as both sides remain aware of the high cost of an all-out battle. Hostilities remain limited to skirmishes, propaganda, verbal abuse, as well as a
tense polarisation of opinions that tends to go through cycles of relaxation, or "detente", and, periods of heightened tensions. Then, anxiety and concern about a possible inequality in strength releases strong fears for an opportunistic attack from the other side.

14 Here, we see the primitive logic of the "deterrent", and the never-ending arms-race; at least, as long as the belligerents remain capable of sustaining the energies required for such an arms-race. Then, they remain locked into an attitude of hostility and suspicion for each other, where the only road to security and "peace" is a carefully maintained balance of power, preferably, with the sneaky feeling that one's own side has a slight superiority, if it ever would come to outright warfare.

15 In the relationships between prey and predator, we see that the battle is heavily weighted in favour of the predator. A species just could not maintain its existence, if each hunt would be a battle for life and death between powers with a near equal strength, because the costs of such a predatorial practice would be too high. There are no benefits, because the winner may be too weakened to make use of his victory.

16 We have discussed man's ferocious and predatory background. As an animal, man is an "obligate predator"; at least, if we look at the fact, that man has to kill in order to survive, be it plant or animal life. We see that man has no choice in this matter. We also see, in man's early evolutionary history, a strong tendency towards the hunt of larger animals. This became possible with advances in the construction and handling of weapons and tools, such as the spear, the stone-ax, the club, the trap, and, later, the bow and arrow, together with more sophisticated organisational techniques between a larger number of people during a hunting operation.

17 Man's evolutionary success led to an increasing population density, and, it is not surprising, that, eventually, the emphasis of courageous and ferocious behaviour shifted from a fight with the larger animals, to a fight with neighbouring and competing human groupings. As far as we can go back in the history of human civilisation, we see, that the defense of one's own territory, or, the successful conquest of tempting territories which are inhabited by weaker population groupings, are a natural, if savage, extention of man's predatorial instincts.

18 Certainly, man is somewhat unusual in the spectrum of life to become so predatorial towards members of his own species. As a rule, territoriality is respected amongst the members of a species, but, human groupings, often, engage
in an all-out struggle with each other, and not, just a territorial skirmish. The reasons are, probably, the ever-increasing density of small human groupings.

19 As we have discussed before, this population density must have reached "crisis proportions" at the beginning of recorded history. At least, it seems reasonable to interpret the rather sudden experimentation with a more settled way of life in much larger groupings, as a behavioural adaptation to these population pressures, or, actually, as a crucial behavioural change into a remarkably different mode of co-existence, which the increasing population pressures of the numerous small nomadic groupings had made necessary.

Chapter 8

Content

How people should be able to successfully integrate into large-scale social entities.
The short life-span of large-scale social units.
We are still unraveling the mechanisms of social growth and decay.
The contemporary ideological struggle between Socialism and Free Enterprise.
An a-moral accumulation of suicidal weapons.
The stalemate of an all-out arms-race.
A solution of social integration to the problems of competitive strife.
How wrong we are, when we think that we are absolutely right and have God on our side.
A persistent effort to avoid polarisations of one sort or another.

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When scientific insights remain powerless. We are still abusing knowledge and technology. Persistent incidences of perceived injustice drive people into fanatic attitudes and behaviour-patterns. How to lose this edge of mutual hatred and alienation. A series of exhortations. Powderkegs can only be maintained in a precarious state of stability for a limited period of time. Trying to avoid the trap of an ignorant demise.

1 Man has learned, quite well, to live together in very large social environments, up to several hundreds of millions of people; provided, that the leadership is competent, the bureaucracy can be kept lean and free from corruption, and, that a majority of the many diverse groupings in such a large society can genuinely experience the fact, that life is better under such a federation, compared to the isolated, and, perhaps, more independent mode of existence which prevailed before.

2 Indeed, it is logical, that a successful integration of people into a large federal state would generate a great deal of energy in the form of exploratory activities or elan-vital, as the energies consumed by hostile bickering and armed clashes have been liberated, and are looking for other channels of dissipation. This vitality may be translated into a far more intense contact amongst the groupings within such a federally integrated social environment; with trade, industry, the exchange of ideas and view-points, as well as a vastly increased knowledge about the many different ways of living and doing things that have sprung-up amongst the various ethnic and cultural groupings.

3 The threat of hostilities amongst rival societies or groupings has largely disappeared, provided, that the central leadership of a large social entity is impartial, powerful, and able to enforce a generally acceptable code of justice. We have also discussed, before, the many reasons, why such "empires" are short-lived, and, we know, now, something about the essential need for an accurate flow of information, in order to safeguard against abuse and corruption. Any position of trust and power in the empires of the past, or the federal States of our own times, can be abused for corrupt practices and attitudes.

4 Empires never lasted very long, and, they always revealed a tendency to crumble, but, later, a different empire would arise, again, uniting a vastly
diversified mosaic of peoples into a transient, large-scale social organisation. It is interesting to note, here, that the reasons for an empire's success seem to be quite different when comparing the history of various empires. Unfortunately, we have too few models for study and analysis, and, it is difficult to come to valid generalised conclusions and really know, which factors led to social growth, and, what sort of developments spelled the beginning of the end.

5 We know more about the factors that are detrimental, in particular, those, which pervert the use of public office, but, it is more difficult to answer the question, why some empires grew in the past, and, why some contemporary nations have grown into a society with several hundreds of millions of people, while others seem to remain fragmented and stagnated, squandering their meagre resources and energies in an endless round of internal fighting.

6 It seems fair to say, at this stage of our understanding, that the common factor of success is, not so much, the result of a particular belief or creed, nor, is it a specific form of social organisation, or the way the economic processes are controlled and regulated, but, the common factor seems to be a psychological one. A large majority of the people must have genuinely experienced a significant improvement in their living conditions, when the diverse groupings fused into a single national entity.

7 The level of justice must have advanced, and, the freedoms associated with equal opportunities must have become much more obvious, regardless, whether or not these equal opportunities were safeguarded by a practice of territorial expansion and a philosophy of free-enterprise, supervised by the morality of a Christian Faith; whether or not equal opportunity came-about as the result of a social revolution and a doctrine of essential equality and equal standards of living. Either system has its own major flaws and draw-backs, and, undoubtedly, a future society will combine the attractive features of both sides in the ideological struggle between Socialism and Free Enterprise, which is still going-on during my time. Hopefully, they will also avoid the pitfalls, which these contemporary systems show, so clearly.

8 The major fallacy each side seems to subscribe to, so wholeheartedly, is the belief, that the competitive rivalries between large nations with conflicting ideologies can be stultified into a frozen but uncomfortable status-quo; by means of an ever-escalating arms-race. Certainly, there is no doubt, that a carefully maintained balance of power will deter either side from carrying-out an opportunistic, predatory attack upon the other, but, it is ridiculous, unnecessary, and, essentially, immoral and self-destructive, to allow an ever greater accumulation of suicidal weaponry.
9 It is just like two quarrelling neighbours, who are frantically "defending" their territories with an ever increasing accumulation of explosives, until both sides are sitting on a powder-keg, where the slightest mistake or a moment of inattention will blow them sky high, together with all the people in the neighbourhood who did not want to have anything to do with their arms-race, but, who had no nowhere to go and had to live in the shadow of these quarreling bullies.

10 Our observations about the evolution of life, together with the search for possibilities of existence, show us, clearly, that the arms-race can only go so far. If species' indulge in an arms-race, their existence becomes burdened by the requirements of their armamentarium. They lose flexibility, and, as soon as the situation changes drastically, (and it always does, sooner or later), they find themselves, not only, with a useless and burdensome weaponry, but, they have become incapable to adapt appropriately, and, what was supposed to be the ultimate in security against a predatorial attack, turns-out to be a liability, as well as a major factor on the road towards extinction.

11 Nature shows us, clearly, from the advent of the biochemical organisation to the symbiotic harmony of the cellular protoplasm; from the cellular symbiosis of multi-cellular organisms to the socialisation of multi-cellular individuals, that a break-through into a new level of security and viability comes, only, with the solution of "socialisation". Socialisation, or social integration is the transformation of a state of competitive inhibition into a state of mutual inter-dependence with a divergence of functions.

12 Our national units are already moving into the direction of inter-dependence because of trade-relations and a dependence upon each other's products and financial transactions, but, our leaderships, as well as our own feelings of national pride, still make many of us behave as staunch patriots, who believe, that they defend the glory of the Fatherland and the honour of their country, their culture and religion, if they take-up arms and do battle with their neighbours.

13 Religious beliefs make us adopt the attitude, that we are absolutely right; that we have God on our side; that we are the champions of everything that is good in the world; that we are right, and, that our enemies are dead-wrong and evil; that they are hated by God, and, that we gain eternal Peace and Glory, if we can destroy them. Unfortunately, as we have discussed, so many times, religious beliefs, often, lead to fanatic attitudes, where people really become an outright scourge for each other, destroying each other in a religious frenzy that is, not only,
The Irascible Personality

appalling and ignorant, but, highly dangerous in view of the weaponry now available.

14 In a more rational and scientific world-view, we do not have to divide the world into "good and bad"; in a "we" and "they", battling for the ultimate victory of Good over Evil. If we look at the major religions, we see, that, both, Christianity and Islam, have a tendency to induce fanatic behaviour, and the time has come to condemn, with strength and courage, all forms of fanatic behaviour, because fanaticism is incompatible with the concept and practice of essential equality. Fanatic beliefs totally ignore the realities of a scientific world-view, which could be so much more convincing and powerful because of the unrivaled mastery it brings.

15 However, as long as we allow this scientific world-view to remain scattered and fragmented, we should not be surprised to see, that, many people will show an aversion for the sciences. As long as we allow our intelligent students to use or abuse science and technology as a way to make a good but egocentric living, we should not be surprised to see, that the scientific world-view remains dim and confused, while it could be so bright and coherent. As long as we continue to squander our resources in a ludicrous and self-defeating arms-race and close our eyes and ears to the gigantic conditions of injustice and inequality, we should not be surprised to see, again and again, the emergence of an emotional and religious world-view, which condemns science as an invention of the Devil.

16 If we do not take some sort of a concerted and deliberate action to safeguard the many fruitful insights of the sciences, and make them more meaningful for our pupils at school, we run a real risk, that, a powerful, fanatic section of the population will, eventually, try to purge the fruits of science and the knowledge of science from our culture, and, we may sink into an intellectual stupor that is comparable to the long period of intellectual darkness and barbaric behaviour, which characterised so much of life in Medieval Times.

17 The time has come to abandon our many ways of abusing scientific insights, where we make sophisticated machines and deadly weapons, and, where we sell our knowledge to the highest bidder, blithely making dooms-day machines, as long as we have a good income. The time has come to put the insights of the sciences into a coherent and meaningful perspective, so that our students get a proper alternative to the religious points of view and their radical and often fanatic solutions to the problems of the world. Then, our young people will have a choice, and they will not be compelled to adopt the religious point of view and the feverish, fanatic practice of a violent confrontation, which is always adopted whenever a crisis is near.
18 Let us teach our youngsters that it is possible to see the world as a fluid and flowing entity of existence, where everything changes and evolves, and, where we see man emerge as one of the many experiments of nature with the possibilities, and problems, of the living organisation. Let us develop a coherent system of thought, which shows us, clearly, that, ethical behaviour and moral principles of conduct are always related to the conflict between egocentric tendencies and the need to behave in a way that is tolerable for those who live in close proximity. Let us show to our youngsters, that we can design a coherent code of conduct. A code, that does not have to be dictated to us as divine commandments, but, a code that flows logically from the principle that we should treat others as we would like to be treated ourselves.

19 As soon as we can see, clearly, that many conflict-situations are due to competitive pressures and tensions between organisms with nearly identical requirements, we lose the edge of hatred and alienation, which seems to build-up, so easily, in a conflict that is fueled by fanatic religious beliefs and attitudes. We can solve the problems of living together. We do it every day in our family-environments, our communities, and, even, in the large-scale national entities, which bring together people from totally different beliefs and backgrounds. The contrasts in culture and belief are not any larger between those nations which now stand poised to destroy each other with many thousands of nuclear missiles!

20 If we can live more or less harmoniously in federations of States and Republics totaling many hundreds of millions of people, then, we can be sure, that we could live together as a world-federation of several billion people. Certainly, we will have to acknowledge the need to control our hostilities and super-power rivalries, but, we will also have to make a serious effort to spread the principles of equality and justice, as well as the techniques of competent, integer and efficient government, all over the world.

21 As nations, we will have to forego the temptation to treat other nations as friends or enemies, just as we can not discriminate in society between people we like and do not like, especially, if we are functioning in an official capacity. Yet, I know, that our leaders will never forego this temptation, unless we, ordinary people, bring consistent and clear pressures to bear upon the instinctive behaviour-patterns of our leaders. Perhaps, we will not learn to do so, until a few, near-fatal disasters have shown us, how vulnerable we are, and, how important it is to rid ourselves of the many dangerous weapons and toxic chemicals we have accumulated.
It is time, that we make a concerted effort to explore the possibilities of a philosophical over-view of the sciences, together with a coherent framework of sound, biologically founded, ethical and moral principles, which will help us to overcome our suspicions and hostilities towards each other, and, which let us fuse, finally, into a more or less harmonious unit of mankind. We will, then, savour a more tranquil and less changeable existence, but, we will also look back with a twinge of nostalgia at the "easy times" of the past, when it did not require extensive safeguards and precautions to shelter ourselves from the pollutants of a highly dangerous environment.

It is time, that we formulate a clear picture of the nature of our existence. We have to know ourselves as an individual who needs strong safeguards against being oppressed and abused, but, also, as an individual with strong needs and tendencies to cooperate with others on the basis of essential equality and equal opportunity; willing to share the burdens and the chores of survival, in order to live under reasonably healthy and decent conditions. Let us study, then, how society is a contract between nearly equally shaped and endowed human beings, where the principles of cooperation and task-division in an atmosphere of trust and openness, may well turn-out to be the only viable road towards long-term survival.

Sure, we all should acknowledge the natural temptation to rely upon our instincts and emotional impulses, which tell us, that security comes first and foremost from strength, as well as from the deterrent of fear and intimidation. Yet, we know, now, because we can see so many examples all around us, that this road may lead to an evolutionary dead-end, and, even, if we see, that it is possible to maintain a certain status-quo with the policies of fear and intimidation, let us not forget, that the maintenance of such a status-quo, also means, the continuation of many conditions of injustice, poverty, deprivation, frustration and resentment.

Powder-kegs can only be maintained in a precarious balance for a certain period of time. Sooner or later, an accident is going to happen, even, if neither side wanted to engage in an all-out conflict. We can offer so much more to our children, as well as the children of our enemies, if we can absorb the many insights and ideas which a careful study of the sciences, together with a philosophic over-view of these sciences, brings to the fore. We owe it to ourselves, as well as to the generations of the future, to do everything we can to point-out the vital importance of such a comprehensive over-view of our own existence. We realise, only vaguely, how significant these matters have become, and, when the times comes that we do realise their importance, it may be too late to avoid the disaster of extinction.
Summary

1. The more we know and can do, the less our influence upon the world seems to be.
   The vastness of "the world" reflects the complexity of our own sensory and interpretive capabilities.
   We make awarenesses possible with our senses and cerebral functions.
   We are the central spectator, giver of life, and creator of the quality of existence to the world of our awarenesses.
   The influence of a chronic "bias" on our interpretations.
   The peculiarities and potentials of the emotionally neutral zone.
   The function of "curiosity".
   Conditions that give rise to exploratory activities.
   The three existential poles of our personality.
   The reproductive requirements of the behaviourally flexible species'.
   The helpless infant.
   The behaviour of parental care and concern is an out-growth of reproductive requirements for behaviourally flexible species'.
   Viability may be found in the ability to adapt to rapidly fluctuating circumstances.
   Classification mechanisms work best, if they are not coloured by strong emotions.
   Being poorly in tune with the prevailing circumstances.
   Why instinctive behaviour is often inadequate; the rage and the panic reaction.
   Emotions need control, not suppression.
   The beneficial results for our behavioural choices, arising from a state of emotional control.
   When sense impressions are evaluated and recorded with clarity and precision "for their own sake".
   Why would such a trend come to the fore?
   The surplus elan-vital.
   Exploring, tentatively and cautiously, the periphery of the known environment.

2. Is the drive of curiosity emotionally neutral?
   An anticipation of excitement.

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An abundance of vital energies has to be channeled.
When governments waste the vitality of their young people.
When boredom and frustration become a spur in the search for excitement
and anticipation.
Exploratory activities are rarely necessary to fulfill an existential need.
What to do with a surplus vitality.
Some like to look at the wide variety of phenomena occurring around
them.
Questioning existing explanations is a difficult road for innovation and
change.
The factor of "authority".
Rejuvenation and innovation may be found through contacts with the
"outside world".
Mechanisms of cultural cross-fertilisation.
Broadening horizons by exploring surrounding territories.
Dispelling the fear for an imagined or exaggerated danger.
Exploring and describing the unknown.
The art of "telling a story" was paralleled by the art of "asking questions".
The quest for precision and honesty.
The art of manipulating an audience, and the need for an objective and
critical evaluation.
The logic and coherence of a story; the "proofs" provided by corroborating
evidence, and the distinction between personal experience and hear-say.
Developing the techniques for a judicial inquiry and the judicial imposition
of a settlement in disputes.
The problem of "judgement" was sometimes "left to the gods".
A "judgement by ordeal".

3. The limited results of scientific observations made with the "naked senses".
The discovery of a much larger and more complex world through sense-
enlarging instruments.
The natural force-fields have been "tamed", at least, conceptually.
Magic represents a logical attempt to influence anthropomorphic force-
fields.
The hope, and the assumption, that the forces of "good" will prevail.
Why the "good guy" always prevails in the world of entertainment.
A limited world of primary sense impressions.
A complex world with sophisticated instruments and experimental
techniques.
The difficult art of separating fact from fiction.
The unidentified flying object; a discussion.
When we step too far on the ladder of unproven assumptions.
The nature of a fiery-red ball of light.
The "mirage".
An unexplained observation does not have to be based on a lie or a deliberate falsification.
We all shrink back from admitting evidence that would profoundly alter the framework of our reality perceptions.
The controversy associated with the concept of "extra-sensory perception".
The gigantic implications of accepting the existence of extra-sensory perceptions.
A strong commitment and a life-long dedication to prove pre-conceived ideas.
The emotional investment of honesty and hard work, and the consequences of accepting questionable assumptions.
The "anti-evolutionary aspects" of the concepts of ESP.
A fluctuating electro-magnetic field around muscle- and nerve-cells.
Can animals and people communicate by sending and receiving electro-magnetic images or wave-patterns, like a television or radio set?
Can we detect a "carrier wave"? A simple experiment.
The difficulties associated with separating an observation from an interpretation.
Dialogues that remain acrimonious and besides the point.
The many forms of "sub-liminal", or sub-conscious communications.
Incidences of "parallel thinking".
The phenomena of premonition and "deja vue".
We are easily touched, or excited, by the occurrence of something that appears to be mysterious.
The eternal hope to gain entrance to a meta-physical reality.
The logic of believing in ghosts.
The influence of beliefs on the interpretation of facts and the explanation of observations.
To make an inflexible judgement of "error" reveals an inability to see the relativity of a specific interpretation of reality.

4. What is a "scientific reality", and, does it represent a "real truth"?
Observations based on shared physiological capabilities.
The "hard work" of verifying what others have discovered over a prolonged period of time.
The problem of specialised knowledge and expertise.
It is not a philosophical luxury to have a good grasp over all the sciences.
The profound influence of science and technology on our way of life, and our ability to survive.
A final flourish before a fatal crash?
In essence, all the force-fields of nature are regular and predictable.
The construction of a framework of "natural laws".
Slowly, the world of matter and energy began to yield to consistent efforts to create order and logical coherence.
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The break-through of the "atomic model".
The various states of matter-energy.
The study of life-forms did not yield easily to the techniques of scientific measurement and description.
The unifying concept of "natural evolution".
The genetic spectrum, and the force-fields of natural selection.

Bold ideas, that arose, primarily, on morphological grounds.

My generation has witnessed a truly astounding expansion of scientific insights.

We have now a good scientific grasp over the phenomena of life and death.

Life is a matter of organisation.

A remarkable relationship between the worlds of living and non-living existence.

A fundamental sensitivity to "light", as well as other, subtle energy-gradients.

Sense-organs are elaborations of pre-cellular, protoplasmic characteristics.

The phenomena of human existence, including the faculty of conscious awareness, are coming within a sure scientific grasp.

A feeling for this gigantic web of togetherness.

A remarkable conceptual coherence.

5. The difficulties associated with teaching a coherent perception of reality.

Letting-go of anthropomorphic images and explanations.

Taking the circumstances we find ourselves in, for granted.

A natural emphasis on adapting to "the facts", rather than inquiring about the reasons for their existence.

The logic of the concept of creation.

God, seen as the "Prime Mover".

Our affinity, or "feeling", for an interminable series of causes and their effects may lead us astray, at times.

Existence can not come from non-existence.

Where does matter-energy come from, or, where does God come from?

The difficult concept of "always".

An audacious assumption, and the consequences of our "sense of mystery".

The emergence of a "hybrid" belief structure.

Leaving room for some sort of anthropomorphic reality perception.

The disadvantages of a scientific schooling that is too narrow.

The failure to see science in an overall and far-reaching perspective.

The consequences for our reality perceptions, whenever we are able to see ourselves as a product of natural evolution.

The inevitable conclusion that a condition of "truth" is a relative judgement.

Experimentation, demonstration and verification are powerful methods of persuasion.
Taking a good look at intuitive and somewhat emotional conclusions. The illusion of having come closer to an ultimate truth. A sobering look at scientific history.

6. Reviewing the various arguments a little more slowly. The many aspects of "change". The concept of "entropy". Organisation breathes life into essentially lifeless elements. Signs of evolutionary change are everywhere. The world of "boundary reactions" between orbital electron-shells of atomic elements. Scientific knowledge is a product of our living existence and existential needs. Manipulability and predictability do not necessarily imply a full grasp over the items we manipulate and predict successfully. The nature of knowledge. A brief over-view of what we know about the world around us. The building-blocks of concepts and ideas, represented by mental images. Many levels of awareness. Can time be reversible? The need for certainty, and the inclination to "jump to conclusions". We never have complete mastery or predictability over the phenomena we are involved with. The temptation to ignore discrepancies. The need to discover "something new". Why our activities depend on the circumstances we find ourselves in.

7. The "organic" nature of beliefs and interpretations. The human nature of "extra-polated realities". The peculiarly human activity of making use of "summarising concepts" represents an important "anthropomorphism" in our reality perceptions. Multiple layers of reality. Micro-scopic and "mega-scopic" worlds. An uncomfortable perception of reality. We all become "set in our ways". Making a living from a little knowledge. Can a scientific reality perception answer questions of a moral or ethical nature? The ability to interpret conflict-situations as a result of natural, logical and fully understood competitive drives. When we become polarised and emotional. The relationships between prey and predator; the advantages of an unequal power-struggle.
8. How people should be able to successfully integrate into large-scale social entities.
The short life-span of large-scale social units.
We are still unraveling the mechanisms of social growth and decay.
The contemporary ideological struggle between Socialism and Free Enterprise.
An a-moral accumulation of suicidal weapons.
The stalemate of an all-out arms-race.
A solution of social integration to the problems of competitive strife.
How wrong we are, when we think that we are absolutely right and have God on our side.
A persistent effort to avoid polarisations of one sort or another.
When scientific insights remain powerless.
We are still abusing knowledge and technology.
Persistent incidences of perceived injustice drive people into fanatic attitudes and behaviour-patterns.
How to lose this edge of mutual hatred and alienation.
A series of exhortations.
Powderkegs can only be maintained in a precarious state of stability for a limited period of time.
Trying to avoid the trap of an ignorant demise.

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